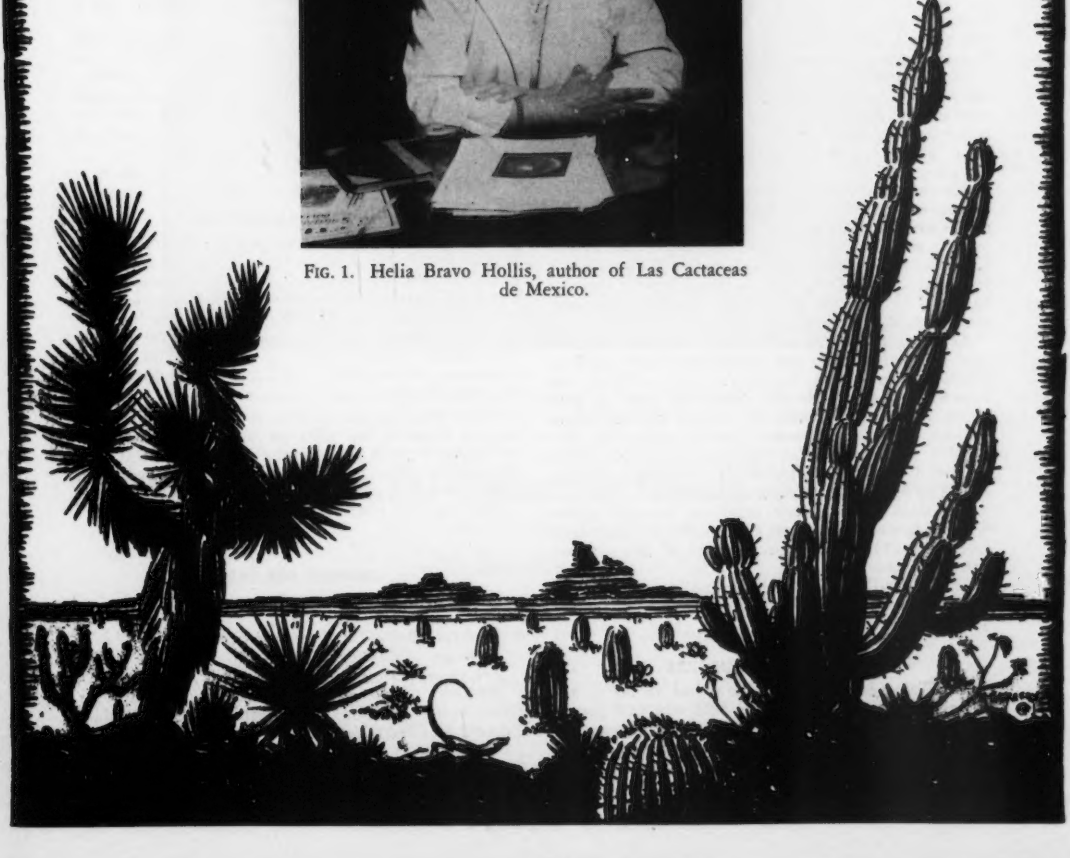
CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

Vol. XXVII JAN.-FEB., 1955 No. 1

FIG. 1. Helia Bravo Hollis, author of Las Cactaceas de Mexico.



CACTUS AND SUCCULENT JOURNAL

Published and owned by the Cactus and Succulent Society of America, Inc., 132 W. Union St., Pasadena, Calif. A magazine to promote the Society and devoted to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. North and South America $3.00 per year; foreign $3.50 by money order. Mail application to SCOTT HASELTON, Editor, 132 West Union Street, Pasadena 1, California. *Editorial Staff:* THE ENTIRE SOCIETY. Entered as second Class Matter at Pasadena, Calif., under act of March 3, 1879. Published bi-monthly. We reserve the right to accept or reject advertising or articles sent to this JOURNAL.

Vol. XXVII JANUARY-FEBRUARY, 1955 (Price 50c) No. 1

CONTENTS

EDITOR'S NOTE

We prophesy that 1955 will be one of our best years for interest in cacti and the other succulents. We hope that once more we will find collectors specializing in one genus, such as Stapelias, Echeverias, Euphorbias, Opuntias, Cerei, Gymnocalyciums, and the many other interesting genera. In looking back over past JOURNALS we miss the valued contributions from those who were specializing. More of our members are sending local cultural experiences and if you like this type of material please let us know and take part in the discussions.

The contents of every JOURNAL will be more helpful to beginners if they will refer to illustrations of the plants mentioned in various books, such as: *Succulents for the Amateur, Glossary of Succulent Plant Terms, Cactaceae* by Marshall and Bock and back issues of the JOURNAL. One of our long-planned projects for the year will be a list of all available JOURNALS as well as a complete new book list.

At this time we thank the many loyal friends who have gone out of their way to purchase books from us. Without book sales we could not continue the JOURNAL so please do not forget to send us your orders and, with exception of some of the rare items, we can be of the greatest mutual assistance. Remember we have no other branches—the same address for the JOURNAL and ABBEY GARDEN PRESS, 132 West Union St., Pasadena, California.

We want to make one important request: please send us flowering data on cacti native to your state (see page 15). Also keep a record of cacti as they flower in your collections.

Let's all pull together in 1955 and we hope to have some pleasant surprises for you.

COLORADO CACTOPHILES

The Colorado Cactophiles have had an active and interesting year. On a group field trip last June I had the thrill of finding a fine specimen commonly called "rattlesnake" crest of *Coryphantha vivipara* about 35 miles southwest of Denver in the area called Top of the World. The crest did not survive transplanting for more than a month and it is now only a dried specimen in my collection.

The center of interest at our Christmas party was a trimmed and lighted 5-ft. *Euphorbia ingens* instead of the conventional Christmas tree. In addition to the usual exchange of gifts with a cactus motif, guests were presented with glasses of cactus jelly made by Opuntia Liz and Mary Heacock from 50 pounds of prickly pears gathered from the Eckstein garden.

E. E.

SUGGESTED MEMBERSHIPS

In order to combat the ever rising costs of production of this JOURNAL it has been suggested by one of our prominent members to offer the following categories of memberships—all with equal privileges:

Cultural Membership . . $3.00 per year ($3.50 foreign)
Beneficial Membership ..... $5.00 per year
Participating Membership ..... $10.00 per year
Sustaining Membership ..... $25.00 per year
Life Membership $100

These modifications involve *no change* in the basic cost to members but offer an opportunity for some to further express their loyalty to the JOURNAL and our Society. This procedure is a common practice in many cultural organizations.

May we have your comments?

OFFICERS FOR 1955

The results of the recent election are as follows:
President—Homer G. Rush.
Vice-President—Dr. Lyman Benson.
Secretary—Ethel Rush.
Treasurer—George G. Glade.

Members of the Executive Board for a four year term: Harry Johnson, Sr., Sherman Ernest Beahm, Edward S. (Ted) Taylor.

ETHEL RUSH, *Secretary.*

FIG. 2
Specimen of *Backebergia chrysomallus* growing near Apatzingan, Michoacan.
Photo by Prof. A. Villalobos.

A New Genus in the Cactaceae Family - Backebergia

(*Pilocereus chrysomallus* Lemaire)

By HELIA BRAVO H.

Translated from *Anales del Instituto de Biologia,* Mexico

On an excursion which a group from the Institute of Biology made to the area of the hydroelectric project on the Tepalcatepec River, Michoacan, in April 1952, I had an opportunity to find, near the town of Apatzingan, a species of cactus of the subfamily Cereoideae which, in spite of the beauty and attractiveness of its cephalium, has remained until now almost unknown. Some months later I had the fortune of again finding it on a hill near Ciudad Altamirano, Guerrero, while making a trip through various parts of the Balsas River basin.

With the data which I obtained of these plants in their natural habitat, as well as that from specimens which I took to the herbarium of the Institute of Biology, I made the following description:

Arborescent plants, at first simple, later branched, about 5 to 6 meters high, with a well defined trunk and usually few branches which carry at the extremity a yellowish cephalium. Branches dark grayish green, about 12 cm. in diameter, which present certain constrictions. Ribs in the younger branches 5 to 7, which with time increase to 9 or 11, 3 to 3.5 cm. high, with the ridges rather sharp and the angle between them more or less open, depending upon the state of turgidity. Areoles close, about 5 to 10 mm. apart, small, circular, about 3 or 4 mm. in diameter and with scarce grayish felt or naked. Spines in variable number; in the specimens from Apatzingan there are 13 radials 1 cm. long, gray with brown point, slender, acicular, with the base slightly swollen, and 2 to 4 central spines similar to the radials; in the specimens from Ciudad Altamirano there are 7 to 9 radial spines and one central with all of the above characteristics; in the two cases the number of spines increases in the areoles near the cephalium, a certain transition being noted to the elements of the cephalium, for the spines lengthen and gradually acquire the form of bristles. The cephalium develops, as stated, at the extremity of the branches which enter in florescence and have the aspect of an antique military crest; it is cylindrical and measures 25 to 30 centimeters in length by 18 to 20 centimeters in diameter; it is formed of short wool and numerous bristles which are inserted in the special areoles of that region, for it must be noted that the ribs with their respective areoles end sharply where the cephalium begins and the areoles do not continue in orderly longitudinal rows but are placed on not very prominent tubercles in more or less spiralled series; in these areoles, as stated, develops abundant wool of a light tawny color and numerous bristles, 50 or 60 to each areole, which measure about 5.5 cm., straight, pungent, black at the base of the cephalium, turning as they approach the top brown, reddish brown, golden yellow and amber; thus the extremity of the cephalium appears surrounded by a golden radiance, very bright in the rays of the sun. The flowers appear in the lateral areoles of the cephalium, never at the top; they emerge from between the bristles and persist for considerable time. In the month of April, when we found the plants at Apatzingan, there were no longer fresh flowers but from the withered remains it was possible to note that they are tubular, widened above, about 4.5 cm. long including the ovary; the tube is provided with numerous triangular scales, short, pointed, which carry spots of short woolly hairs and a few bristly hairs especially in the areoles at the base of the tube; these do not hide the tube; the segments of the perianth are short; their color as well as that of the tube could not be determined on account of being withered; the stamens are inserted all along the tube especially toward the base; the ovary is also scaly with wool and certain bristles in the axils. The fruit is oblong, about 3.5 cm. long by 2 cm. in diameter; at first and when fully ripe it is somewhat fleshy, has a wine red color and a sepal odor; the surface carries triangular scales with wool and certain slender bristles, about 2 cm. long, of brownish color, which occur especially in the scales near the tube; the bristles and wool do not completely hide the pericarp as occurs in *Pachycereus grandis*. The dried fruit with the dried remains of the perianth adhering, remain among the bristles of the cephalium for some time. The seeds have the form of a comma, measure 4 mm. in length by 3 mm. in diameter at the widest part; the hilum is lateral and basal; there is a roughness in the form of a crest which surrounds the seed on the convex part; the test is somewhat brilliant with papillous slightly prominent ornamentations of irregular circular outline, with small punctuations; the crest has the same ornamentations but quite elongated. Birds and ants intervene in the dissemination of the seeds. Among the bristles of the cephalium I found various species of ants, a few pseudoscorpionoids and larva of ticks.

To attain an identification of this plant, it was necessary to revise literature of the past century relative to Mexican species of cerei for in modern works I did not find any described with the characteristics of this one. In this way I was able to infer that it was sent to Europe in the years 1836 to 1839, during which time various foreign explorers and collectors of plants covered our country, enriching the herbariums and botanical gardens of London, Paris, Brussels, and other European places with Mexican species.

M. Cels, French horticulturist, appears to have given it its first name, calling it *Pilocereus militaris,* for the horticulturists who later described it make reference to him. (Förster, C., *Handbuch der Cacteenkunde,* 2nd edition 652, 1886.)

In *Revue Horticole II,* 4, p. 289, 1845, there is an article signed by Neumann which refers to a cactus which M. Ocampo, of Mexico, sent to the Botanical Garden of Paris, and which was given the name of *Pilocereus niger* due to the blackish color of the cephalium. (Undoubtedly he refers to Don Melchor Ocampo, Mexican politician and botanist who at that time was studying our cacti. See his article "Memorandum on the genus Cactus of Linneaus" published in the periodical of the Sociedad Filoiatrica de Mexico, 1844.)

Audot, another distinguished French horticulturist, described in the above Revue II, 4, p. 307, 1845, a Mexican cereus under the name of *Cereus militaris.* The description reads:

"Tous les voyageurs naturalistes que ont parcouru le Mexique y ont appris l'existence d'une espéce decereus portant une coiffure élevée en forme de colback de grenadier. Cependant aucun de ces voyageurs n'a pu découvrir jusque 'a ce jour ce végétal remarquable. M. Joseph Vandick, d'Anvers, voyageant dupuis quelques années dans ce pays inmense, a eu le singulier bonheur de trouver ce fameux cactus, el l'a envoyé derniérement á M. de Jonghe, de Bruxelles, 'chez lequel je viens d'admirer cette plante bizarre.

"Ce genre de cactus a recu le nom de CEREUS, a cause de sa ressemblance avec ses congénéres, et de MILITARIS, á cause de sa coiffure qui ne se forme que lorsque la plante a acquir 8 a 10 ans. Le nombre de ses côtes diminue á mesure que le colback se développe. 'Dans le pays el sur les lieux oú le colback se forme et se dresse, on n'en voit plus que 6, 7 et 8. Parvenu á sa grandeur ordinaire, le candélabre se dresse et se développe; il produit, dans cet état, un effet magnifique, dont les indigénes comme les étrangers sont fortement impressionnés. C'est alors ausi que le colback se couvre de fleurs au sommet et tout autour. Les fleurs, assez grandes, sont d'un beau jaune et répandent une agréable odeur de vanille. De plus,

FIG. 3
Cephalium of *Backebergia chrysomallus* with a few dried fruits among the bristles. The closely placed areoles can also be seen.

elles durent longtemps et récompensent ainsi l'attente assez longe de l'amateur qui cultive ce cactus. M. de Jonghe sera bientót en mesure d'en livrer aux amaterurs de ce genre de plantes."

Neumann, editor of the *Revue Horticole,* adds the following:

"Nour avons lieu de croire qui le cereus qui vient d'etre décrit est le *Pilocereus niger* envoyé au Jardin des Plantes par M. Ocampo, et qui nous avons décrit dans notre derniére livraison, p. 289."

In the year 1847, Ch. Lemaire published in "Flore des Serres et des Jardins de L'Europe, III, p. 242," an article under the name of *Pilocereus chrysomallus,* in which the following is stated: "There has been received from Mexico recently a very interesting specie and very characteristic of the genus *Pilocereus,* which some horticulturists have called *Cactus militaris* because its top (cephalium) represents very well the form and aspect of certain military caps (Kolback). M. Galeotti, who has dedicated himself with such zeal and success to the cacti, showed me a dried terminal fragment of a specimen of the species in question." From this plant Lemaire made the following Latin description:

"P. ramosus (?) erectus robustissimus; angulis 12-15 (v. amplius) validis; fasciculis valde approximatis,

FIG. 4
Cephalium of *Backebergia chrysomallus* at the point where it begins; the bristles have been cut so that the spiralled direction of the areoles in the cephalium can be observed.

tomento albido brevissimo persistente; aculeis 20-25 conformibus divaricato-arcuatis gracilibus griseis inaequalibus (plus minusve pollicaribus), internis paulo robustioribus. Cephalium (verum!) subpedale rotundatum obtusum caulem terminans et undique obvolvens (nec unilaterale et hemisphaericum ut in P. senilis) lana densissima oppressa fulva brevissima formatum, aculeis fulvo-aureis divaricatis gracillimis criniformirigidis pollicaribus, et ultra undique opertum et adeo innumerabilibus, adeo intertextis ut nil tomenti adspiciatur. Florum siccatorum vestigia solummodo vidi nec agnoscenda. Semina reperi reniformia nitida nigra laevia, et in nonnulis ovariis plane disiccatis larvas cujusdam insecti observavi."

And later he adds: "In a live state this plant, from its bonnet of gold from which its vividly colored flowers stand out, must present a truly ornamental aspect. Our specific name refers to the color and form of the cephalium (crisos, gold; mallus, cap, head of hair)."

A still more precise description of this cactus is found in the work of Carl Friedrich Förster, *Handbuch der Cacteenkunde*, Leipzig, 1846; on page 652 of the second edition, 1886, it reads as follows:

Pilocereus chrysomallus Lem. Location: Peak of Colima, Mexico. Stem high, branching with age, dark grayish green, with many ribs. Ribs somewhat wide

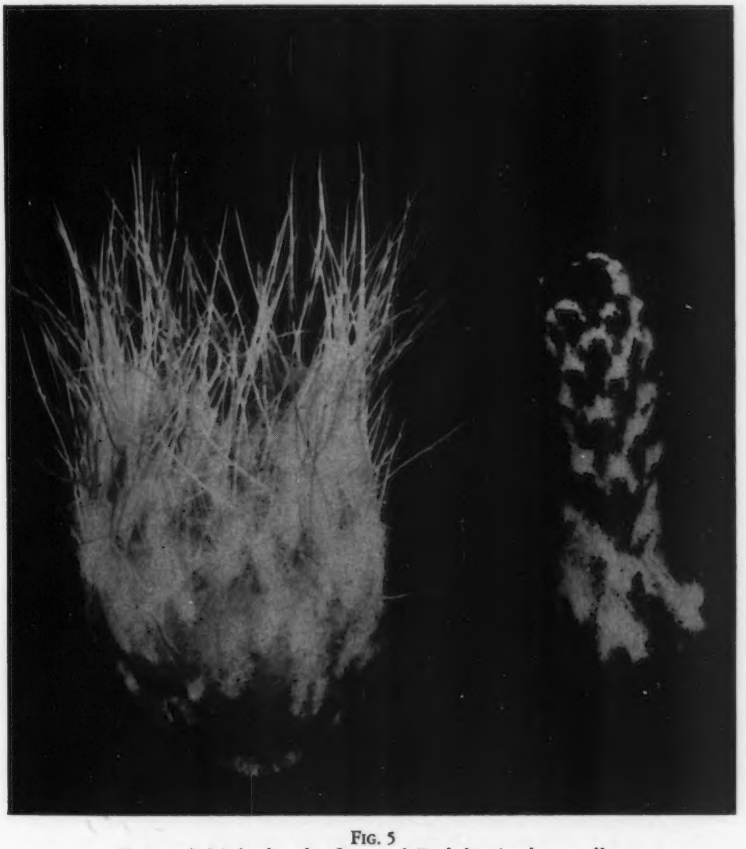


FIG. 5
Fruit and dried tube of a flower of *Bachebergia chrysomallus.*

with sharp ridge. Spine cushions small, located close together, 9 to 11 mm., at first with white felt, later naked. Spines grayish brown, slender, rigid, erect. Marginal spines 8-12, radiating regularly, 9 to 10 mm. long. Central spine 1, thicker and curved. In our collections specimens are found from 60 to 70 cm. high and 8 cm. in diameter, with 13 ribs. Flowers and fruit unknown, but the cephalium in which they develop is. This is located at the top of the stems and highest branches. At the time of floweration the ribs do not produce more spine cushions; these become converted more properly into crowded tubercles, spirally arranged, which form a tuft 30 cm. high and 15 cm. in diameter. The tubercles are at first provided with dense wool of a light yellow color, and then with many spines in the form of hairs, 5 cm. long and of chestnut color; thus the tuft is yellow above and brown below and it is due to this so outstanding cephalium that the Mexicans call this cactus "grenadier's cap."

J. Labouret, in his work *Monographie de la famille des Cactées,* p. 276 (1852?), describes this species also with the name *Pilocereus chrysomallus* Lem. (textually it reads "Chrysomullus," due possibly to a printing error), giving as synonyms *Pilocereus militaris* Cels and *Pilocereus niger.* This description is similar to that of Förster and for this reason we do not quote it.

In 1894, Karl Schumann, in *Naturlichen Pflanzenfamilien III,* 6th, p. 182, placed this species in the genus *Cephalocereus* and in his work *Gesamtbeschreibung der Kakteen* 200, p. 1903, gives the following description of the species:

Arborescent, at first simple, later *very* branched, up to 10 meters high or more, dark grayish green color, rounded above. Top completely invisible due to a crest of very dense spines among which are white woolly hairs. Ribs in the young plants cultivated by us, generally 13, later probably more, erect, separated by narrow grooves. Ribs obtuse, only very lightly sinuate; areoles close, 9 to 15 mm. apart, circular, 6 to 7 mm. in diameter, covered with white wool from which long woolly hairs grow. Marginal spines 11 to 13 in the form of strong, subulate, elastic bristles, the upper ones shorter, the lower up to 3 cm. Central spines 5 or less, in cross formation, erect or oblique, of which the lower is heavier and longer than the others; all spines are yellow in color, more or less light or dark, tending toward brown; later they are gray. The cephalium forms a cylindrical helmet which

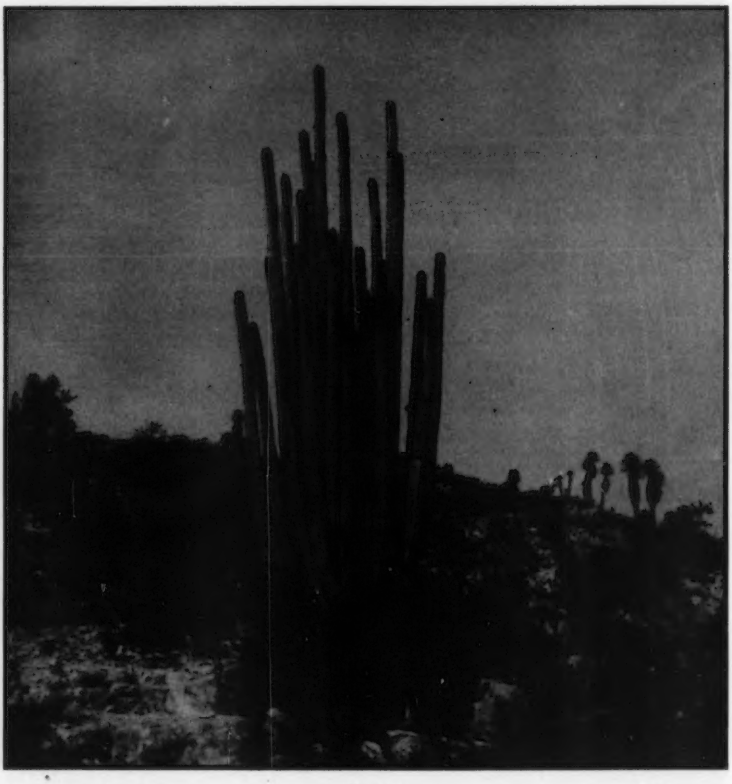


FIG. 6
Gigantic specimen of a centenarian *Mitrocereus fulviceps* (*Pachycereus chrysomallus* B. & R.) of Tehuacan, Puebla. Observe the abundant ramification and the great length of the branches.

becomes up to 30 cm. long and 15 cm. in diameter, dropping over the stem unilaterally from the apex, resembling an antique military helmet; the wool is light bay color, turning brown below, from which grow bristles similar to horse hair, 5 cm. long or more, which completely cover it. Flower and fruit unknown. Geographic distribution: Peak of Colima, Mexico. Synonymy: *Pilocereus chrysomallus* Lem., *Cereus chrysomallus* Hemsl., *Pilocereus militaris* Hort.

In 1920 the American botanists Britton and Rose described in their work *The Cactaceae* II, p. 72, a plant from the Tehuacan plateau of Puebla, under the name of *Pachycereus chrysomallus* (Lemaire) B. and R., with the following synonymy: *Pilocereus chrysomallus* Lemaire; *Cereus chrysomallus* Hemsley; *Cephalocereus chrysomallus* Schumann; *Pilocereus fulviceps* Weber, and *Cereus fulviceps* Berger, indicating at the end of their description that *Cereus militaris* Audot and *Pilocereus militaris* (Salm-Dyck) were names probably belonging to said species.

The description which they make of the Tehuacan plant is as follows:

"Stem columnar, massive, at first simple, but in very old plants much branched, giving off hundreds of erect branches which form an almost compact cylinder up to 5 meters in diameter, becoming 12 to 18 meters high; branches glaucous green, 11 to 14 ribbed; flowering branches capped by dense masses of brownish wool; areoles approximate or even confluent; radial spines about 12, slender; centrals 3, 1 very long, sometimes 12 to 13 cm. long; flowers borne near the tops of the stems of branches, 6 to 7 cm. long; the bud, afterwards the flower, and finally the fruit, completely concealed in the long wool; ovary covered with small, pale, imbricated scales; flower tube also covered with imbricated scales, but these larger and pinkish, pointed; flowers doubtless opening at night, but still expanded at 8 o'clock in the morning; tube proper 10 mm. long or less; throat funnelform, 3 cm. long; inner perianth segments and stamens inflexed after anthesis, with the stiff outer perianth segments pressed down upon them; stamens attached all over the throat, the innermost and lower row united at base and appressed against the style; filiments cream-colored; style stout, stiff, 7.5 cm. long, cream-colored; stigma lobes linear, erect, cream-colored."

This Tehuacan plant had already been studied by Dr. Weber (Dr. F. Weber, physician who came to Mexico at the time of the French inva-

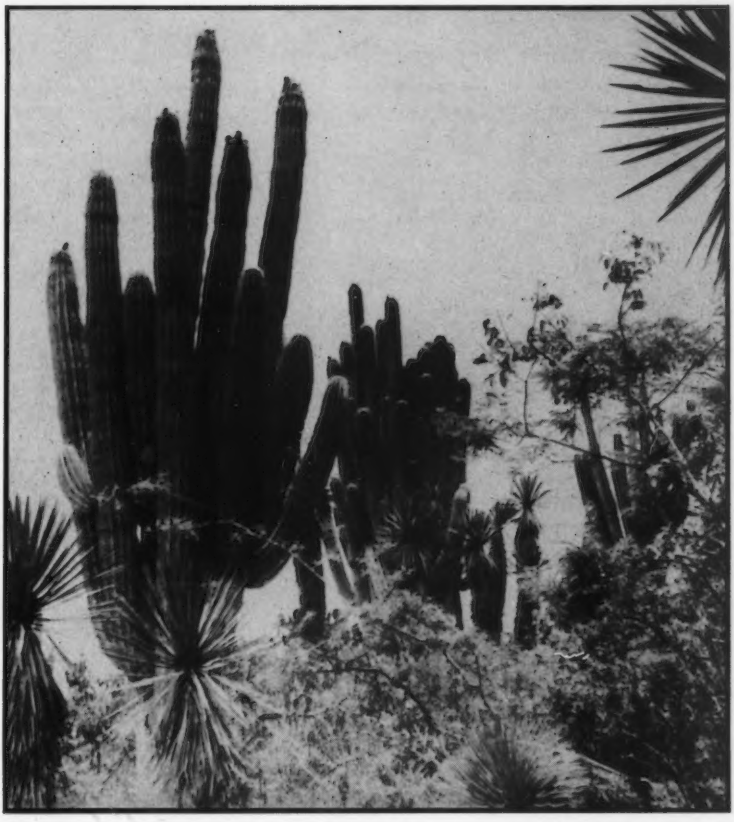


FIG. 7
Relatively young specimen of *Mitrocereus fulviceps* (*Pachycereus chrysomallus* B. & R.) of Tehuacan, Puebla. Note the woolly apical area with a few flowers on it. Photo Dr. M. Ruiz O.

sion, travelled in various parts of the country and was a great student of cacti which he also cultivated with great eagerness) who furnished Schumann with the data for the description which the latter author used under the name *Pilocereus fulviceps* Weber, on page 176 of his work *Gesamtbeschreibung der Kakteen* 1898, as follows:

Stem erect, greenish gray, up to 10 meters high or more, about the thickness of a fist, not very greatly branched; branches erect. Ribs about 15, divided by deep grooves; areoles naked. Marginal spines 12, radiating. Centrals 3, of which one is heavier and horizontal while the 2 or 3 upper ones are smaller; all spines are rect, rigid and strong. The flowering areoles, located on the upper part of the branches, are covered with yellowish wool, deciduous after flowering; the spines with time become more slender. Flowers very fleshy, 8 cm. long; ovary and tube of purplish red color covered with scales in the axils of which grow abundant long, yellowish, woolly hairs, from among which emerge long bristles of reddish brown color; this woolly hood covers all of the flower and keeps it together so that it is only possible to see the edge of light rose color; this has a maximum diameter of 8 cm.; stamens very short attached to the tube in steps; yellow elongated anthers; white style, yellowish, thick (3 mm.) extrudes from the flower 3 cm. Many of the flowers fall as small balls of yellowish wool.

If the descriptions of Audot, Lemaire, Förster, Schumann, and Britton and Rose are compared with the one I made of the plants from Apatzingan, it can be seen that all fundamentally agree with it with the exception of the one of Britton and Rose and the one of Dr. Weber, who describe a different species. Their descriptions not only differ in the morphological characters attributed to that species (*Pachycereus chrysomallus*=*Pilocereus fulviceps*), but also in the geographic distribution assigned to it, for *Pilocereus chrysomallus* Lemaire is found on the Pacific slope (Peak of Colima, Apatzingan, Ciudad Altamirano) while *Pachycereus chryso-*

mallus B. and R. is found toward the Gulf slope (Tehuacan).

These species have in common only an area with yellowish wool at the apex of the stems.

The differences between both species can be seen from the following chart.

	PILOCEREUS CHRYSOMALLUS Lemaire	PACHYCEREUS CHRYSOMALLUS Britton and Rose
Stems:	Slightly ramified, 5 to 6 meters high.	Greatly ramified, up to 18 meters high.
Ribs:	At the beginning 5 to 7, later 9 to 11; ridge narrow.	At first 11, later 14; ridge rounded.
Areoles:	Close, 5 mm. apart, circular, 3 to 4 mm. diameter, with scarce gray felt.	10 to 12 mm. apart, elliptical, 10 to 15 mm. long, with yellowish or grayish felt, later naked.
Radial Spines:	7 to 13, acicular, 10 mm. long, gray with almost black point.	9 to 10, up to 18 mm. long, yellowish white or grayish brown when old.
Central Spines:	1-2-4, of the same color, form and size as the radials.	4, the lower longer up to 5 cm., yellowish white; on old plants there is one up to 8 cm. long, grayish brown with brown almost black point.
Insertion of Flower:	In the cephalium, laterally.	In the woolly area but at the apex.
Tube and Ovary:	Scaly, axils with spots of short wool and some bristles; elements which do not hide these organs.	Scaly, axils with many long silky hairs which hide these organs.
Apical area of the stems:	With abundant long wool and numerous bristles produced from areoles which do not follow the direction of the ribs.	With abundant long wool, produced from areoles which follow the direction of the ribs.

As the classification of the cactus family has suffered certain changes since the time of Lemaire, the problem is presented of fixing the present systematic position of *Pilocereus chrysomallus* Lemaire.

At present the majority of the cactologists are following the classification of Britton and Rose, but a more detailed study of the species as well as the discovery of many others has caused certain authors such as Backeberg to form new genera and undertake new changes in classification.

If in fixing the present systematic position of *Pilocereus chrysomallus* Lemaire had followed Britton and Rose, said species might have been included in the genera *Pachycereus,* taking into account the following characteristics: arborescent, flower tubular, ovary and tube scaly, covered with small scales which carry wool and bristles in the axils, fruit globular, the areoles of which, provided with scales, wool and bristles, are persistent.

However, it cannot now be included in this genus, for Backeberg only considers as *Pachycereus* species of this group without an apical woolly area, since with the only species of *Pachycereus* which has this form and which is precisely *Pachycereus chrysomallus,* he erected the genus *Mitrocereus* (Backeberg. *Some Results of Twenty Years of Cactus Research.* Arranged by E. Yale Dawson in Cactus and Succulent Journal (1950-1951) 22 (6) 188; 23 (4) 121.) to which he assigned the following characteristics: Gigantic cereus, with woolly apical area; nocturnal apical flowers, campanulate, very woolly and silky, hiding the flower; fruit dehiscent at the apex.

The species under study, in spite of its woolly area, cannot be included in *Mitrocereus* because there exist between the two, as can be seen from the above chart, very marked differences such as: a cephalium with special structure; lateral flowers; areoles of the tube and ovary with wool and bristles which do not hide said organs; arborescent but not gigantic, with few branches and a different geographic distribution.

Considering these morphological differences, I believe that a new genus should be established for *Pilocereus chrysomallus* Lemaire, which I have called *Backebergia,* name given in honor of the distinguished cactologist Curt Backeberg.

BACKEBERGIA nov. gen.

Arborescentes, paullo ramosi. Rami area apicali (cephalio) areolis seriebus spiralatis dispositis, lana copiosa, brevi, multisque setis longis; primum 6-7, mox 9-11 costis initio cephalii desinentibus et areolis proximis, parvis, circularibus. Flores tubo et ovario squamosis; axillae squamarum flocculis lanosis brevibus et pilis paucis longis setosis tubum non tegentibus instructae. Fructus primum carnosus, vineo-ruber et odore sui generis, mox siccus, ovoideus, squamis lana et pilis setosis longis pericarpium non tegentibus. Semina commae forma, testa nigra plus minusve nitida, ortata.

Arborescent with few branches. Branches with an apical area (cephalium) with areoles arranged in spiral rows, carrying abundant short wool and numerous long bristles. Ribs at first 6 to 7, later 9 to 11, which end where the cephalium begins, provided with closely placed areoles, small and circular. Flowers with tube and ovary scaly; scales with axils containing spots of short wool and few long silky hairs which do not hide the tube. Fruit at first fleshy, of wine red color, with a special odor, later dry, ovoid, provided with few scales with wool and

FIG. 8
Apical zone of an adult branch of *Mitrocereus fulviceps* (*Pachycereus chrysomallus* B. & R.), after florescence. Observe the areoles with still some wool and the long acicular spines.

long silky hairs which do not hide the pericarp. Seeds in the form of a comma, with black testa, more or less bright and provided with ornamentations.

Genera with one species:

Backebergia chrysomallus (Lemaire) Bravo

Pilocereus chrysomallus Lemaire, Fl. Serr. 3: en pl. 242. 1843.

Cereus chrysomallus Hemsley. Biol. Centr. Amer. Bot. 1: 541. 1880.

Cephalocereus chrysomallus Schumann, Engler & Prantl., Pflanzenfam. 3, 6th 182. 1894.

The description is the same as that of the genera.

Type: Herbarium of the Institute of Biology of the National University of Mexico, under number 518.

Type locality: Apatzingan, Michoacan.

Distribution: Balsas basin, Peak of Colima.

The names given by horticulturists of the past century were: *Pilocereus militaris* Cels., *Pilocereus niger* Neuman (?), *Cereus militaris* Audot.

In terminating this article I believe that it is also opportune to state that *Pachycereus chrysomallus* B. & R. should now carry a new name,

that of *Mitrocereus pulviceps* (Weber) Backeberg. *Mitrocereus* because of having changed genus in accordance with the arguments of Backeberg, and *fulviceps* because that corresponds to it by priority since the description of the Tehuacan species made by Schumann in 1898 from data furnished by Dr. Weber was prior to that of Britton and Rose.

I wish to thank Dr. Leonila Vasquez and Prof. Alejandro Villalobos for their valuable aid in my field work.

SUMMARY

1. The author found a little known cereus near the town of Apatzingan, Michoacan, and a little later on a hill near Ciudad Altamirano, Querrero.
2. This species was sent to European botanical gardens during the years 1836 to 1939, where horticulturists gave it the following names: *Pilocereus militaris, Pilocereus niger* and *Cereus militaris.*
3. Lemaire made the first Latin description of this plant placing it in systematic botany under the name of *Pilocereus chrysomallus.*
4. Förster made a more precise description of the species.
5. Schumann placed it in the genus *Cephalocereus,* describing it under the name of *Cephalocereus chrysomallus.*
6. Britton and Rose described a Tehuacan plant under the name of *Pachycereus chrysomallus,* in the belief that it was the *Pilocereus chrysomallus* (Lemaire), which species had already been studied by Weber and described by Schumann under the name of *Pilocereus fulviceps.*
7. The author identifies the plants from Apatzingan and Ciudad Altamirano as *Pilocereus chrysomallus* (Lemaire), calling attention that *Pachycereus chrysomallus* (Britton and Rose) is a different species.
8. As the classification of the cactus family has changed since the time of Lemaire, a systematic revision of *Pilocereus chrysomallus* (Lem.) is necessary, and the formation of a new genus which the author calls BACKEBERGIA.
9. A description of the new genus and species.
10. The author explains her reasons why *Pachycereus chrysomallus* (B. & R.) should carry the name of *Mitrocereus fulviceps* (Weber) Backeberg.

BIBLIOGRAPHY

AUDOT, 1845.—Revue Horticole II, 4, pp. 507 and 508, Paris.

BACKEBERG, CURT, 1950-51.—*Some Results of Twenty Years of Cactus Research,* arranged by E. Yale Dawson in the Cactus and Succulent Journal.

BRITTON, N. L., and ROSE, J. N., 1920.—*The Cactaceae* II, Washington.

FORSTER, C., FRIEDRICH, 1886.—*Handbuch der Cacteenkunde,* 2nd ed., Leipzig.

LABOURET, J., 1852.—*Monographie de la Famille des Cactées,* Paris.

LEMAIRE, CH., 1847.—*Flore des Serres et des Jardins de l'Europe* III. Gande.

SCHUMANN, K., 1894.—*Naturlichen Pflanzenfamilien,* III, 6th 182.

————, 1898.—*Gesamtheschreibung der Kakteen,* Neumann-Neudamm.

ELLEN ROOKSBY AND DESERT PLANT LIFE

By REID MORAN, Berkeley, California

Reprinted from Journal of the California Horticultural Society, Volume 15, Number 3

From the first issue, in May of 1929, *Desert Plant Life* was the work of Ellen Rooksby; for the twenty-three years of its existence, she was editor and publisher. With her death, on October 2nd, 1952, *Desert Plant Life* necessarily came to an end.

For Mrs. Rooksby, publication of the magazine was not a business but a hobby; yet it was a hobby that became her main concern in life. With the increased interest in succulent plants in Southern California in 1929, *Desert Plant Life* arose to fill a local need. As she said, the object was to get the information about cacti and other succulent plants from those who had it to those who wanted it, making the process as pleasant as possible to both. At first, under the name of "Desert," it had pages nine by twelve inches and was rather crudely printed. The printing and the quality of the paper were soon improved, and, as Mrs. Rooksby's artistic sense found expression, the format became more attractive. *Desert Plant Life* proved to be of more than local interest; and beginning with volume 10, the size was reduced to six by nine inches, so that the magazine could more easily be sent through the mail.

Because of her knowledge of German, Mrs. Rooksby was able to correspond with various German botanists and plantsmen interested in succulents, with the result that she obtained articles by such writers as Berger and Von Poellnitz. There were biographical sketches of many botanists, some written by Mrs. Rooksby in her own sympathetic and whimsical style. She encouraged and gave a start to young writers. She stressed reviews of new literature, both native and exotic; and she tried to keep a balance between articles addressed to the beginner and those of a more technical nature. Thus, *Desert Plant Life* gave broad coverage to the subject of succulent plants.

As Mrs. Rooksby grew older, running the magazine became more of a task. She found it ever more difficult to meet the deadlines imposed by the post office for second-class mail, and these deadlines became her bugaboo. In 1951 *Desert Plant Life* became a quarterly. She thought there was some justification for issuing it less often, since a subscription to *Desert Plant Life* was about the only thing that hadn't increased in price since 1929. "In 1929 when *Desert Plant Life* began its career as the only magazine in the English language on the subject of succulents, $1.50 was set as the yearly subscription price. This was sufficient to cover production costs ($1.49) with a margin of 1 cent profit . . . But twenty-two years, a depression, and two major wars have absorbed the surplus."

Mrs. Rooksby succeeded in producing an attractive and interesting magazine with much of lasting value. From all sides come regrets at the death of Ellen Rooksby and the passing of *Desert Plant Life.*

HUECO MOUNTAINS

By MRS. JAMES S. BROWN

The El Paso Cactus and Rock Club wishes to acquaint the Society members with some interesting facts about the Hueco Tanks, which are to be the site of a field trip during the Convention of the Society, to be held in El Paso, July 8th to 12th, 1955.

Within thirty miles of El Paso, on the Carlsbad Highway, is the picturesque and fascinating Hueco Tanks, a wonderful picnic spot, providing rocky shelters and water, and presenting a myriad facets of interest to the visitor, from Indian pictographs to geological grandeur.

Located in the Hueco Mountains, a range of perhaps 100 square miles, the "tanks" are permanent catch-basins of rainwater in a waterless desert. Long before the Rocky Mountains appeared, these granite rock formations were thrust through the earth's surface. Enormous rocks are scattered on the slopes like piles of pebbles, sometimes 100 feet high.

Numerous natural caverns and projecting rocks have offered shelter to travelers for eons. The pre-Pueblos, Pueblos, Apaches, Jumanos and Navajos stopped here for rest, water and hideouts after raids. Here is the famous Ceremonial Cavern from which archeologists have reaped invaluable clues to bygone ages. Artifacts and relics, from arrowheads and pottery to some 1200 pairs of sandals, were found here. According to one theory, the Indians left the wornout sandals in which they made the pilgrimage to the Ceremonial Cavern.

Forest Kirkland, in the Bulletin of the Texas Archeological and Peleonological Society, Vol. 12, September 1940, says, "During our investigation we examined more than sixty shelters which had smoke-covered walls and ceilings and thirty-five of these contained pictographs. We also found pictographs under thirteen overhanging cliffs and in twenty-three niches and crevices too small to have been used as living quarters. The picture sites are distributed over all the rugged parts of the formation but shelters near the large water-holes contain the greatest number and variety of pictures."

The pictographs represent men, animals, birds, snakes, and fantastic figures, and in the way of the white man, some are superimposed by means and dates of those who passed through a century or less ago. The traveler is directed to one more easily reached "tank" by the black-painted letters, "Watter Hear," with an arrow and hand pointing to the water.

The Butterfield Stage in the 1850s, on its route from San Antonio to San Diego, used the stage-station kept here by a few guards as an over-night stop-over.

Fortunately, owners of the land have appreciated the importance of the Hueco Tanks as a link to the romance of the past, and it is being kept as a private park, with no so-called "improvements."

John H. Leasure, Chairman of the 1955 Convention of the Cactus and Succulent Society of America, has prepared the following list of cacti to be seen in the area around Hueco Tanks.

BOTANICAL NAME	COMMON NAME
Coryphantha aggregata	Pincushion
Coryphantha macromeris	Strawberry
Coryphantha muehlenpfordtii	
Coryphantha neo-mexicana	Evening Star
Echinocactus horizonthalonius	Devil's Pincushion
Epithelantha micromeris	Button
Escobaria tuberculosa	Hen and Chickens
Echinocereus chloranthus	New Mexico Rainbow
Echinocereus dasyacanthus	Texas Rainbow
Echinocereus fendleri	
Echinocereus rosei	
Echinocereus stramineus	Haystack
Echinocereus lloydii	Pink flowered Rainbow
Ferocactus uncinatus	Turkshead
Mammillaria denudata ..	Button
Mammillaria meicantha	Birdnest
Opuntia arborescens	Tree
Opuntia grahamii	
Opuntia kleinae	Pencil
Opuntia leptocaulis	Rattail
Opuntia lindheimeri	Prickly pear
Opuntia macrocentra	Prickly pear
Opuntia aranaria	Sand Cactus
Peniocereus greggii	Night Blooming Cereus

A TIP FROM A MEMBER

Recently I received a letter from a member in the state of Washington, which related quite clearly an experiment she had used to overcome the very troublesome black rot which comes so often to succulent plants, due very largely to over-watering. Following are some quotes from her letter which explain quite clearly what she did to remedy and relieve her trouble:

"I received a lovely *Stapelia gigantea* from Johnson's Cactus Gardens last February. There were five healthy fingers to the plant and I overwatered it and black rot set in. I baked the soil and re-planted it several times but I still kept losing parts of the plant, till I got down to one piece. Then I melted some paraphine wax and cooled it till it would not blister my finger, then I dipped the butt of the plant in this about one inch deep, then re-potted it. That was in July, I have not had any trouble with it since, it is re-rooted and I am waiting for new growth. I have also used this method on Aloes, Haworthias, Barrel Cactus and Epiphyllums with equal success."

MRS. ZEALA BUCKNER
1537 Hannegan Road,
Bellingham, Washington.

This member has probably discovered a remedy for one of the common ailments which many amateurs have encountered at one time or another. Mrs. Buckner would be very happy to correspond with any member of the Society. H. R.

BLOOMING DATES OF CACTI AND OTHER SUCCULENT PLANTS AT BRYN ATHYN, PA., 1954

Billbergia nutans, January 8 to end of month, each flower lasted 3 days.

Kalanchoe fedtschenkoi, January 16-March 7.

Crassula multicava, January 22 to March 7.

Rebutia violaciflora, March 24-28, April 11-18, and 24-26, flowers open all day 3 days each.

Mammillaria "new white," March 30-April 4.

Wilcoxia senilis, April 7-15, 3 flowers open all day, 3 days each.

Mammillaria multiceps, April 7-11 and 21-22, 4 flowers.

Nopalxochia ackermannii, April 18-28, 10 flowers each open all day, 3 days each. May 3-29, 9 flowers, June 11-13, 17-19, 20-22 and July 3-5.

Euphorbia splendens, April 11 to June 8, nearly continuous bloom starting indoors.

Mammillaria elongata, April 13-15.

Chiapasia nelsonii, April 14-25, 7 flowers each open 3 days and May 29-30.

Echinopsis turbinata, 2 plants, April 21-22, open in the evening of the first day and till noon or later the next day, April 27-29, 2 flowers and June 1-2 and 21-22, July 24-25, and 30-31, and August 15-16.

Echinocereus reichenbachii, April 23-25, day bloomer.

Lophophora williamsii, April 25-26, May 8-11, June 8-11, 14-18, 24-25, July 3-4, 22-24 and August 1-2.

Lobivia aurea, April 29, June 2-3 and 21-22, 5 flowers open 1 day each, day bloomer.

Echinopsis hamatacantha, flowers open all day, 1 day each, May 2-3, June 1, 13 and 24, July 11, 17, 25 and 26, and August 5.

Rebutia kupperiana, May 8-30, 8 flowers open 3 days each, June 22-23, 25-26, and July 13-15.

Echeveria derenbergii, May 27-28.

Lobivia famatiensis, May 29, day bloomer.

Echinocereus caespitosus grafted on *Cereus peruvianus,* May 29-30, day bloomer.

Gymnocalycium damsii, blooms a few hours each afternoon several days, sometimes as many as 6 flowers open at once. May 29-June 1, June 7-14, June 22-July 13, August 12-19, October 1-10, pretty white flowers.

Notocactus submammulosus, June 1-7, day bloomer.

Rebutia senilis, June 2-10, day bloomer, each flower open several days.

Echinopsis kratochviliana, a short tubed white day bloomer, (a Lobivia?) 2 days each. June 15-18 and 27, July 11-12, 26-27, and August 1-2.

Gymnocalycium quehlianum, flowers open several hours each on several afternoons. June 7-8, July 6-15, August 22-24.

Gymnocalycium mihanovichii, striped chin cactus, 3 plants, flowers bloom several hours each afternoon several days, as many as 5 flowers open at once. June 11-13, and 17-25, July 1-6, 13, and October 13.

Chamaecereus silvestrii, 2 plants, day bloomer, June 13-17, and 22-23, and 27-28, July 1-14. 12 flowers open 2 days each.

Rebutia pseudodeminuta, June 14-16, and 22, July 18, 30 flowers as many as 11 open at once.

Echinopsis eyriesii, 2 plants, pale pink flowers opening in the evening of one day and closing before noon the second day. June 19-21, 3 flowers, July 11-12, July 30-31, August 12-13, 3 flowers, and 30-31.

Echinopsis eyriesii, white flowers with greenish sepals, June 20-22, July 12-13, August 13-14, August 30-31. Flowers open in the evening and stay open next morning.

Gymnocalycium mostii, cream colored cup-shaped flower open 3 afternoons June 23-25.

Opuntia compressa, June 25-July 5. Day bloomers.

Gymnocalycium joossensianum? flower like that of *G. damsii* but more slender. June 26-28, July 1-6, and 18-28, August 8-13. Afternoon bloomer several days.

Gymnocalycium mihanovichii, plaid cactus, 3-headed plant and rooted offset, as many as 9 flowers open at once on 3-headed plant. Like striped chin cactus but stripes more pronounced and flowers brownish white instead of greenish white, July 1-26, August 6-September 5 and September 24, October 12, and 23-25.

Astrophytum asterias, day bloomer, July 6-7, and 13, and August 11, and September 9 and 21-22.

Epiphyllum oxypetalum, night bloomer stays open next morning in cool weather. July 10, 19, 20, 4 flowers, 21, and August 4, 5 flowers, August 5, 4 flowers, August 6, 3 flowers, September 7, 2 flowers, and September 8, 4 flowers.

Notocactus ottonis, July 12-13, and 27-28, 5 flowers, August 1-2, August 8, 2 flowers, and 16, 2 flowers

Rebutia xanthocarpa, July 14-16, 1 flower open 3 days, day bloomer.

Gymnocalycium frederickii, apparently a pink flowered, reddish bodied variety of *Gymnocalycium*

mihanovichii, variety *stenogonum,* rose plaid cactus, July 22 to August 1, August 8-13, October 4-10, and 23-25, afternoon.

Mammillaria durispina, July 25-31, August 3-September 26, tiny red flowers, day bloomer.

Selenicereus pteranthus, July 27, 2 flowers at night, August 13.

Arthrocereus (*Echinopsis, Seti-echinopsis*) *mirabilis,* July 30 at night.

Dolicothele sphaerica, day bloomer, as many as 5 flowers open at once, August 4, 13-7, and September 1-6.

Frailea grahliana, August 14-31, flowers colored but failed to open. Fruit ripe October 25.

Mammillaria rhodantha, tiny pink flowers daytime, as many as 5 flowers open at once, August 22-23, 27 and 31, September 1-20.

Hamatocactus setispinus August 25 and 31, September 1-30. Day bloomer.

Stapelia hirsuta, several plants, August 26, September 6-October 13, October 22-November 4, November 8 and 13-19, 4-petal flower.

Stapelia gigantea, August 27, October 5-11, November 13-15.

Lobivia breviflora, August 31, September 3, 2 flowers, and 29. Day bloomers one day each.

Stapelia variegata, September 30-October 7, October 31-November 2, November 7, 2 flowers.

Crassula sp., tiny white flowers, red anthers and pollen. Leaves thick, smooth and entire, November 4-December 8. Very inconspicuous flowers.

Echeveria sp., flowers pale orange tinted deeper at tips, leaves smooth, entire, glaucous, purplish, ovate, in a rosette, Decembr 8-31 and later.

Echeveria sp., leaves as above but flowers a deep orange. December 26-31 and later.

Euphorbia submammillaris, corn-cob Euphorbia, was noted in bloom in May and June but the dates of first and last flowers were not observed. Tiny inconspicuous flowers.

These plants were grown indoors in cold weather and outdoors from the middle of May to the end of September by Arthur B. Wells, Box 213, Bryn Athyn, Pa.

My *Rebutia senilis, Chamaecereus silvestrii,* and *Echinopsis turbinata* bloomed for the first time after being kept all winter without watering in a cold frame where the temperature dropped to the low twenties Fahrenheit. I read in "Flowering Your Cacti" by E. Lamb that keeping Rebutias and other cacti cool and dry all winter caused them to bloom.

I started growing cacti in 1939 when I saw cacti and succulents in the window of the house in England where my mother-in-law lived. I bought a packet of mixed cactus seeds in England and planted them on my return home. Since then I have bought cacti and other succulents from dealers in California and Arizona and dime stores in Philadelphia, Pa., and have grown some plants from seeds bought and received as gifts from friends and from fruits of my own plants.

In my cold frame some seedlings of *Opuntia engelmannii* froze while others were uninjured and one cluster of *Echinopsis* froze at the roots but the upper parts were not frozen. I scraped off the frozen tissues and rooted the tops. Buds were formed on the unfrozen tops but none of them opened.

I have over 400 plants most of which are wintered in a porch enclosed in glass and heated by a bucket a day stove.

A growing library helps me to identify some of my purchases from dime stores and gives me much useful information in regard to pests and cultural practices. ARTHUR B. WELLS, P. O. Box 213, Bryn Athyn, Pa.

EDITOR'S NOTE: The flowering dates of cacti and succulents are most valuable. After flowering, most plants like a rest period during which time watering should be lessened. We would like to request members in all parts of the world to send us lists of cacti especially and the dates of flowering. The growing conditions should also be noted—whether habitat, indoors, glasshouse, or out door plantings. We are working on a very important publication and careful observations will add to the value of this work. Be sure that the plant is correctly identified. Field observations will be of the most value and altitudes, soil conditions, temperatures, and exposures (north, south, east or west) should be given. Send your reports to the Research Board, attention Scott E. Haselton, 132 W. Union, Pasadena, California.

CACTUS AND SUCCULENT SOCIETY OF CALIFORNIA
Oakland, California

The regular November meeting of the Cactus and Succulent Society of California was held at the W. C. Andrews home, 5161 Trask Street, Oakland, on Sunday, November 15. This was our election meeting and the new officers elected for the two year term of 1955 and 1956 are as follows:

President—Anna M. Genasci.
Vice-President—Thomas Juul.
Secretary-Treasurer—John L. Hastings.
Directors—Harry M. Butterfield, Al. Irving, Darian Small, Myron Kimnach.

Paul Hutchison of the University of California Botanical Garden gave an informal, slide-illustrated talk. He showed colored slides of many plants that have bloomed at the Botanical Garden. He also showed slides of native Korean succulents taken by Reid Moran. Included among the other slides were several habitat pictures of *Utahia sileri* growing in gypsum beds in the Utah desert area, taken by Paul on one of his field trips.

The December meeting was turned over entirely to our Christmas party. Gaily wrapped plants were distributed and a delicious Christmas buffet dinner prepared by Mr. and Mrs. W. C. Andrews was enjoyed by the forty-five members and guests present.

ANNA M. GENASCI,
Affiliate Secretary.

EXCHANGE COLUMN

Would like to exchange native cacti and other succulents for certain Rebutias. For specific list of plants write Mrs. J. L. Vaninetti, Lapwai, Idaho.

WANTED: C. D. Phillips, 1711 Berkley, Dallas, Texas, would like to contact other members who live within 150 miles of Dallas.

A Fruiting Christmas Cactus

By H. TEUSCHER,

Curator of the Montreal Botanical Garden

The accompanying illustration shows *Zygocactus truncatus,* the Christmas cactus, with both flowers and ripe fruits. The fruits have been on the plant for almost a year now, because they resulted, of course, from last year's flowering. As can be seen, they are still plump and fresh. If it were easy to get the Christmas cactus to set fruits, this would be a means of extending its ornamental effect over 12 months, because the shiny, 1½ cm. long berries are very pretty. They are at first pale violet-mauve in color but are gradually turning more and more red as they ripen. By the time the new flowers appear, their color is almost the same as that of the flowers.

Unfortunately, fruiting of the Christmas cactus is rare because its flowers are self-sterile, which means that they are unable to set seeds with their own pollen. Neither is it possible, of course, to fertilize the flowers with the pollen of a daughter plant—one raised from cuttings of the same plant—because such plants still are only parts of one and the same individual, forming together what is called a "clone." It is evident that members of the same clone will be unable to fertilize each other's flowers when the plant itself is self-sterile. Since the Christmas cactus is nearly always propagated from cuttings, separate clones which are fertile with each other are quite rare in cultivation.

We were able to obtain fruits, because several years ago we raised *Zygocactus truncatus* from seeds obtained from Europe, and, by later taking cuttings from several of the seedlings, we established several distinct clones. It we were to sow the seeds from the fruits of the illustrated plant, each seedling would be a new individual, and any seedling would set fruits with the pollen of any of the other seedlings. Cuttings taken from the seedlings would form new clones, and the different clones likewise could be fertilized with each other's pollen.

There is one other way of getting a Christmas cactus to develop fruits. Actually, there are two distinct types of cactus which botanically are even separated in two genera but which are commonly called "Christmas cactus." They are so similar in general appearance that their differences are frequently overlooked and that both are sold and cultivated under the name *Zygocactus truncatus.* This confusion is a very old one and still persists. The true *Zygocactus truncatus* has rather sharply pointed teeth on both sides of its flat joints, especially towards their tips, as can be clearly distinguished on the photograph. Its flowers are irregular in shape. The other Christmas cactus, *Schlumbergera bridgesii,* which actually is more likely to flower at Christmas—*Zygocactus* usually flowers in October-November—has round indentations on the sides of its joints and no teeth. Its flowers are regular in shape like those of Epiphyllum.

Schlumbergera gaertneri, with rather long brown bristly hairs on the tips of the joints, is another occasionally cultivated species of similar appearance, which, however, flowers normally in spring (May-June). It is commonly called "Easter cactus" but comes a bit late for Easter.

The flowering periods of *Zygocactus truncatus* and *Schlumbergera bridgesii* overlap—the *Schlumbergera* usually commences about 2 weeks later—besides, both commonly flower twice, in fall and in spring. The two readily cross with each other, and anyone, who has both or who can obtain pollen from a neighbor who happens to have a plant of the other Christmas cactus, can obtain fruits by pollinizing one with the other. A small, soft painting brush is the best tool to transfer the pollen to the pistil.

There is still a third possibility which may be mentioned. As far as the writer knows, it has never been tried on a cactus, but we expect to experiment with it, and others may wish to do likewise. This consists in the employment of a hormone spray, such as is used for instance on greenhouse grown tomato plants to induce fruit formation. The highly ornamental, long lasting fruits of the Christmas cactus certainly would be worth the negligible expense and effort. If this works, plants of the Christmas cactus garnished with their handsome berries for many months may become a frequent sight, but fertile seeds must not be expected to result from such a treatment.

The illustrated plant, by the way, consists of a number of cuttings which about 18 months ago were inserted in a small ball of sphagnum moss held together by copper wires. The moss was first soaked in water to which 1 teaspoonful of hydrated lime and 1 teaspoonful of Ra-Pid-Gro per gallon were added. It was then pressed out gently and formed into a tight ball. Thereafter, the plants were watered once a week and when at rest once in two or three weeks. When in growth they received every two or three weeks alternately a watering with a weak infusion of cow manure and a weak solution of Ra-Pid-Gro. They flowered for the first time about 6 months after the cuttings were inserted. The manure water can probably be omitted, and other fertilizers equally complete as Ra-Pid-Gro

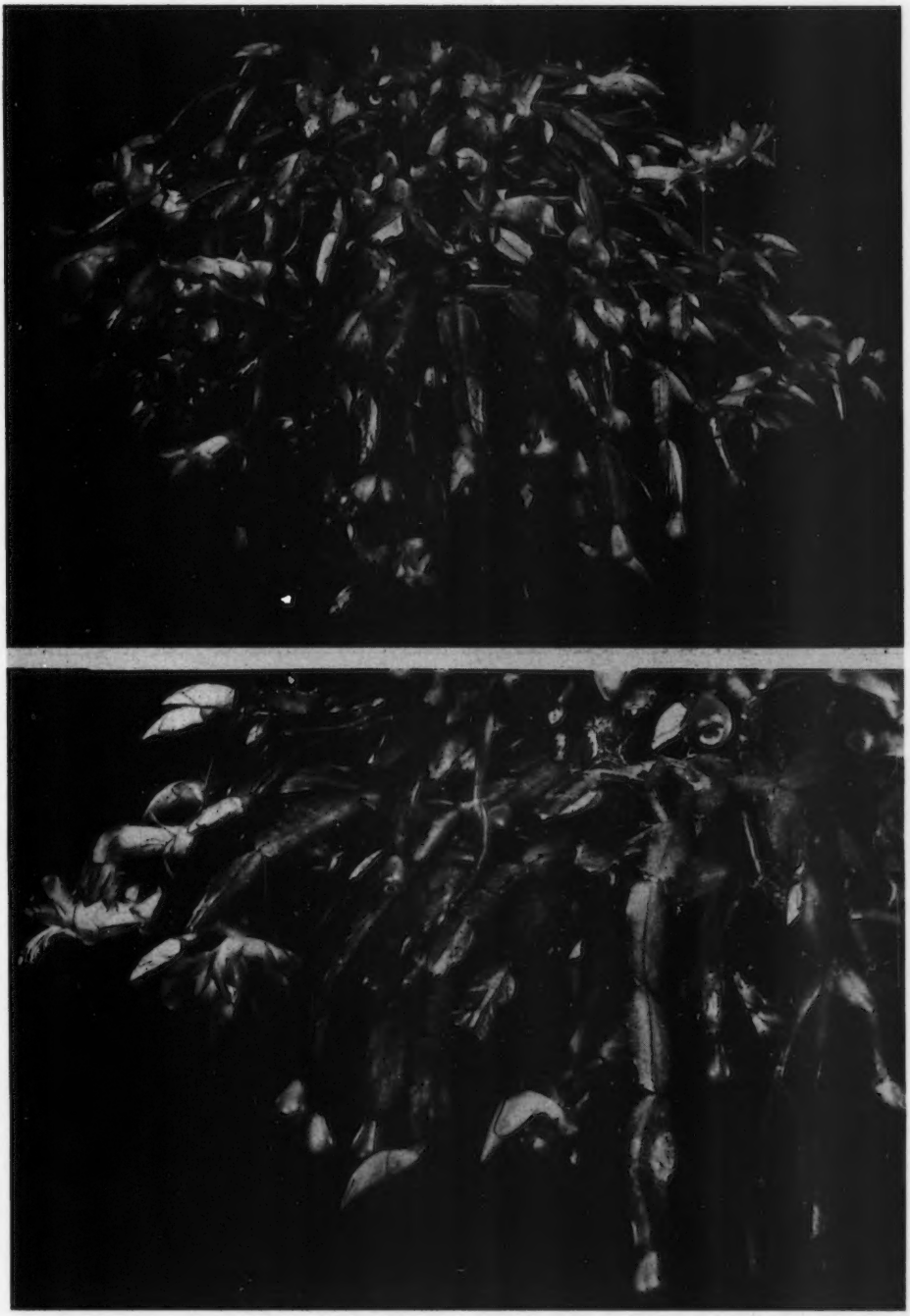


FIG. 9. *Zygocactus truncatus,* 18 months old from cuttings, with flowers and fruit. Note the close-up of colorful fruit in lower photo.

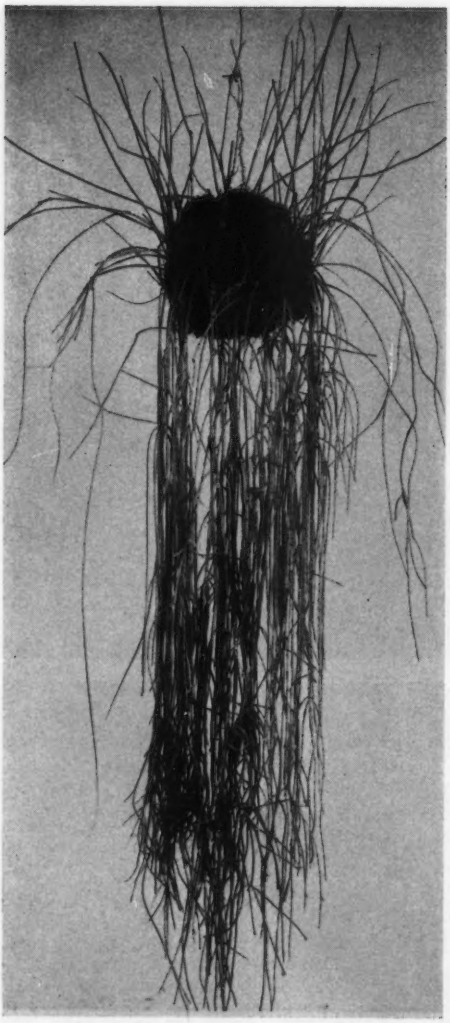


FIG. 10. *Rhipsalis puniceo-discus* in sphagnum moss ball. Plants are 15 months old from cuttings. Hanging branches are 3 feet long.

may be substituted. Growth of the Christmas cactus, however, is much more satisfactory and its general health is much superior when planted in sphagnum moss than when planted in soil. The small original quantity of lime, added to the water in which the moss was soaked, seems to be important.

Other cacti and succulents, even those from desert habitats, may be grown in sphagnum moss also and succeed extremely well, strange as this may seem. Especially for the epiphytic ones, such as *Epiphyllus, Zygocactus, Schlumbergera* and *Rhipsalis,* culture in suspended balls of sphagnum moss fed with weak doses of fertilizer can be highly recommended. Invasion of the moss by algae can readily be prevented by covering the outside of the moss ball with Osmunda fiber.

ROUND ROBIN 1

The Robin made a quick trip this itme. Gladys Panis of Massachusetts reports few flowers in the past year, due mostly to cold and cloudy weather. She found out the hard way this winter that *Cereus peruvianus* is not hardy. Marian Fox has her troubles growing cacti in her trailer, but she is starting more seeds and hopes to find a place for the plants when (if!) they grow up. Mary Anderson enclosed a fine color picture of her *Opuntia compressa* in bloom—this seems to be the same plant that grows wild on the director's Missouri farm. Ella Nipper has made a "totem pole" for her Ceropegias to climb on—she takes a 10″ wide piece of ¼″ hardware cloth (36″ width), rolls it into a cylinder and ties it, then sets it into an 8″ pot with gravel halfway up the pot. Cylinder is filled with a mixture of sphagnum moss, peat and sandy soil with a little fertilizer and a small flower pot sunk in the top to fill with water. Fill the pot with soil, plant Ceropegia tubers in it and train the vines to grow spirally around the cylinder. Sounds like a fine idea! The director reported on a trip to St. Louis, of which the most enjoyable part was attending the Christmas meeting of the Henry Shaw Cactus Society. Everyone was so friendly that it was hard to leave. It was a privilege to meet and talk with Lad Cutak.

MARY KARR

THE PHILADELPHIA CACTUS AND SUCCULENT SOCIETY PROGRAM 1954-55

Meeting Place: Morris Arboretum, Gates Hall, 9414 Meadowbrook Avenue, Chestnut Hill, Pennsylvania.

February 13, 1955—2:00 p.m. Topic: Seedlings. Speaker: Mrs. Arthur P. Fenton, Jr. Exhibits: Bring flowering Cacti and/or Succulents, also home grown seedlings. Plant of the Month: Bring your (3) best Succulents.

April 10, 1955—2:00 p.m. Topic: Grafting. Bring plant material. Speaker: Mr. A. Malcom Martin. Exhibits: Bring flowering Cacti and/or Succulents. Plant of the Month: Bring your best Columnar Cactus.

June 12, 1955—12:30 p.m. (Note time.) Picnic—box lunch. Topic: Cactus Record. Bring your pictures, scrap book, slides, etc. Plant of the Month: Bring your best Echinopsis.

Officers for 1955: President—Elmer L. Rist. Vice-President—Arthur B. Wells. Secretary-Treasurer—Edith R. Butler.

MALCOM MARTIN, *Publicity.*

HOW YOU, TOO, CAN GROW CACTI AND SUCCULENTS

By ANTHONY BARONE
Men's Garden Club of Regional Detroit

Whether you call me a "Cactophile," "Cactus Nut," or "Cactus Maniac," I am really no different from any other houseplant grower. But over the years I have picked up a few answers to problems that trouble cactus growers, like the often asked question "How often should I water my plants?"

That's a tough question to answer unless you consider the many angles to it such as plant size, pot size and type (clay or glazed), room heat, and sun exposure. Although in their native habitat cacti and succulents are forced to weather many dry spells, that's no reason why your potted plants should ever be allowed to become entirely dry. This dries their feeding roots so that they may rot when you finally do water them.

Cacti and succulents in their native habitat have one big advantage over house plants. Clay pots absorb water from potting soil, reducing the water available to the plant. To overcome this, set pots in a moisture-retaining material such as vermiculite, or seasoned peat moss.

POTTING

If you are restoring a plant that has been neglected or one that has been shipped to you, first remove it from the soil and cut off all dried roots. Treat with Rootone Hormone, then repot it in soil, setting the plant in a pocket of sand in the pot's center.

The smaller the pot, the better. Do not make the error of setting a small plant in a large pot thinking that it will keep you from repotting or watering so often. Actually, only a small amount of soil is required to supply food and moisture, and to anchor the plant —excess soil over these requirements might prove detrimental. I have found that plants put into large pots usually rot and die.

Of course, small pots must be watered more often but they both absorb and evaporate water more evenly than larger ones. Too, large pots are deceptive; they may look dry at the top and sides yet the center soil may be moist.

CACTI, OUTDOORS AND INDOORS

The adaptability of cacti is evident in the fact that one species grows abundantly outdoors in Whitehall, a suburb of Muskegon, Michigan. It is *Opuntia polyacantha:** on about June 15, these plants are a mass of buds and blooms. It is an easy matter to cut pads from these plants and pot them without roots in three-inch pots. I have often seen started plants from this source on sale.

This Opuntia is hardy and can be planted in your own perennial flower beds, but it must be in well drained soil and where it gets full sunshine. Other Opuntias may be found growing outdoors in all but two states in the Union—Maine and New Hampshire.

Not all cacti do well when taken from their native habitat. I have seen many species taken from the wilds of our Southwest and shipped to our large cities where they are put on sale in masses, unpotted. The cacti do not do nearly so well as the succulents that are sometimes shipped in with them. While the cacti are hardly worth taking home the succulents root very easily and in time make very nice house plants.

WHAT PLANTS TO BUY AND WHERE TO BUY THEM

I would recommend the use of plants started from seeds and grown in greenhouses until ready for shipping. Many such concerns advertise in flower and garden magazines. May I suggest a few cacti and succulents that do well in average homes and that do not take up much room?

One type of Century Plant, or Agave, that takes only a small space is *Agave victoria-regina.* It will not grow out of bounds for at least ten years. It grows into a rosette of thick leaves four to six inches long, each marked with white lengthwise lines, and bearing a short spine at the tip. There are no marginal spines.

Another slow-growing class of plants are the Aloes. *Aloe aristata* forms a stemless rosette having numerous, spreading leaves. Leaves taper to a point and are three-quarters of an inch wide by three or four inches long. *Aloe begunii* is similar but has fewer, more robust leaves.

Aloe variegata, Partridge Breast, has lance-like leaves four or five inches long. Each leaf has a concave top and a keel. Irregular, whitish lines cross the leaves.

If you want to study curious spine and nipple formations, try the most interesting group of small cacti called the *Mammillarias.* Their nipples are in spiral transverse rows. Forms having many different spine formations are available.

When you are ready to give succulents a try, start with a fine group called the Haworthias. These have no spines, require little space, and grow slowly and uniformly. Many varieties are available, with different leaf shapes and markings—all are easy to grow in homes.

If you like fast growing plants try *Agave americana.* But look around for a large place to put the plant; within two or three years it will get quite large. Fortunately, small, new plants can be started from offsets.

Not only are cacti grown for interesting plans and spines. Flowers in some are exquisite. Those of the Epiphyllum rival orchids. Is it any wonder, then, that I am not only a "Cactus Bug" but am *proud* of it, too?

**Opuntia compressa?*

THE PERFECT SYSTEM?

From the New Zealand Cactus and Succulent Journal

The hobbyist in any form of plant culture, particularly when he is a successful show exhibitor, usually keeps secret those little details which he believes give him the lead over other competitors. The fact that his nighbour may be equally successful with a different set of "secrets" does not change his ideas. This is probably just as well, because what may work well with one person may be a complete failure with another. So many unpredictable features have a bearing upon the overall picture.

One person's glasshouse runs north and south, another's goes east and west. My own is in a valley where, on frosty winter nights, the temperature will drop almost 4° lower than 100 yds. along the road. But in summer, light breezes miss me and pass overhead, leaving my place much hotter. But my glasshouse runs east and west so that the north side is baked all day while the south side is considerably cooler.

The matter of soil mixture is a continual problem. Different writers tell us just what they consider a certain species likes. I believe in many cases their advice is purely theoretical and that they have had little or no practical experience at growing the plant. They give their advice chiefly from what they have read about the plants' natural habitat.

We all know the nature of the soil varies considerably from place to place. One suburb in Auckland will be soft powdery volcanic, nearby you'll find a heavy sticky clay. With the right treatment its' probable both can be made to give satisfactory results but it's certain the one set of rules would not work for both.

If we have one plant of a certain species and find it doing very well we cannot safely say it's because

that plant is receiving ideal treatment. Or if a plant seems to be doing badly it does not necessarily mean that the soil or conditions are poor.

In our early enthusiasm the Society arranged a test of growth in soil supplied by a number of members. The results obtained were quite misleading and were of no practical use as a guide to suitable mixture or conditions. Anyone who has grown a box of cacti seedlings will know how the plants vary in size after a year's growth. The soil throughout the box is uniformly mixed, they all get equal water and temperature, yet some will be several times larger than others growing only an inch away.

A couple of plants cannot possibly give the answer to whether the soil is good or not. They may be "good doers" or entirely the opposite and so the result tells us nothing. To be of any value a test would need to cover a batch of many plants in each sample of soil, it would have to run for several years, and the final conclusions would have to be based upon the aggregate of growth of each batch.

Even after all this the soil and conditions which applied to the test plants . . . say Rebutias . . . might not work out with Astrophytums.

All this simply means that there is no perfect system which would suit all. We learn the essentials . . . drainage and watering . . . and the rest is a matter of observation and experimentation. That probably is why we get such a kick from our hobby, each plant is a separate problem to be solved.

FIG. 11 *Haworthia retusa* var. *desiflora* G. G. Smith nat. size.

Notes on Haworthias

J. R. BROWN

Haworthia retusa var. **densiflora** G. G. Smith in Journ. So. Afr. Bot. XII (1946) 7, fig. 2 & Pl. 1.

Plant stemless, simple, 9-10 cm. in diameter.

Leaves, younger erect, becoming spreading, the oldest more or less recurving, to 4.5 cm. long, to 2.5 cm. broad and to 1.5 cm. thick in thickest part, light green; face of leaf below end-face smooth, the end-face 2.5 cm. or more in length, to 2.5 cm. broad, somewhat convex, deltoid, acuminate, pellucid, shining, with small raised concolorous tubercles and with about 11 longer and shorter pale green lines, the middle one almost reaching the tip; occasionally on some leaves a few tubercles may be observed below the end-face; back of leaves convex, smooth, somewhat acutely keeled in the upper part, the keels with numerous fine greenish-pellucid teeth; margins with numerous greenish-pellucid teeth in the lower part, margins of end-faces entire or with very small teeth; terminal bristles to 6 mm. long.

Locality: Cape Province: Riversdale Distr.

Differs from *Haworthia retusa* (L.) Haw. by the more acuminate end-faces, the toothed margins and keel, and the longer terminal bristles.

This Haworthia of the sect. *Retusae* owes its name to the crowded raceme. The tubercles on the end-faces seem to be more prominent towards the margins; the teeth on the upper leaf margins are very variable, the margins may be smooth, or one margin only may be smooth, or the minute teeth may be more or less scattered.

FROM MICHIGAN

Now for a bit of fan mail. As I told you in my earlier letter, I am raising some cacti and especially seedlings in a box placed on its side in a niche at the head of the stairs. This is lighted with electric light bulbs and one fluorescent tube at the top. The box measures about 3 feet high, 4 feet wide and 15 inches deep and at present I am using 3 75 watt bulbs and the plants are spaced between 10 and 20 inches from the nearest light bulbs. This keeps the plants nice and warm—75 to 85 F. The fluorescent bulb is on day and night, the other bulbs are on about 12 to 14 hours during the day.

The seedlings are germinated and grown until ready to transplant in two plastic greenhouses which set in the box. These are made from 4 clear plastic dishes 12 by 8 by 4 inches deep. Water is placed to cover the bottom of these greenhouses and the pots with seeds or seedlings are set in dishes inside so that the pots will not be standing in water. Then the other plastic dish is inverted over the lower one to hold in moisture.

Our soil is sandy. Muskegon is on the east side of Lake Michigan near the sand dunes. Climate wet, cloudy and changeable. Much snow and cold winters. We have one wild cactus in this county, *Opuntia rafinesquei?** Yellow blossoms in summer, pads as big as ones hand, growing 2 or 3 joints high and the old pads dying off each year. Have too much shade from oak trees to grow it myself. Very spiny.

Had no luck with seedlings until I used Chlordane and Arasan or sometimes Rootone to keep down parasites and damping off fungi. (Rootone contains some Arasan along with certain chemicals which stimulate the growth of roots). You see with me the soil might be perfectly sterilized—autoclaved—and still it would soon get reinfected. This way I can keep the seedlings on the damp side without having them damp off. I use one or two spoonfuls of chlordane mixed well into the soil for a 4 inch pot. The Arasan is dusted on top and worked into the upper inch of soil. Both of these chemicals have a tendency to leach up and down I think. Sometimes one finds a brownish scum creeping up on a small seedling which may not be good for it?

As for the soil, itself, I like plenty of humus. Some good black dirt, rotten wood, woods dirt, coarse dry grass, etc., and by having a good mixture I figure that some of the seedlings will find something they like. So far I have got rid of gross parasites, by boiling, not baking, the soil before adding the chlordane and Arasan for about 15 minutes and I do this when the wife is out of the house, so I can air out before her return. Of course the soil is spread out and dried before potting.

The nice thing about seedlings is that one gets plants that one would never find in the Dime stores. My too small south windows will not hold big plants, but one can find a lot of varieties in a few hundred small seedlings which are just as interesting.

WM. S. CHAPIN, M.D.

* * *

FROM THE PRESIDENT'S DESK

With the complete returns in and the election of officers an item of history, the other officers and myself are very happy to continue to try to build the Society policies into the sort of organization you wish it to be.

At the suggestion of a number of members located in parts of the country where they cannot have a close acquaintance with the Society and its officers, I will try to give a short report of the progress made during 1954 and the condition at the end of that year.

During 1954, the Society sponsored two large garden tours, both very well attended; a field trip into the desert for an overnight camping trip, very well attended; and three lectures, accompanied by colored slides, on succulent plants by speakers who did an excellent job of explaining their trips and the plants concerned.

Concerning the membership increases during 1954, am hapy to report that about 125 new memberships were received during the year, partly from normal sources and partly as a result of the membership contest

In addition to these, a number of new Associate Memberships were obtained and two new Affiliates joined with the Society.

As regards the financial condition of the Society, it must always be remembered that the Society is not in any way to be considered a profit making organization as the only methods by which the Society can raise money for themselves is from the formation of new Affiliates or the acquiring of new Associate memberships and during 1954, the acquiring of new members for the Society, for which the Editor has allowed the Society a commission.

The Society has for years tried to maintain a small general fund, to cover the cost of stationery, stamps and other supplies, and a convention fund to help defray the expenses of the conventions, which are not always covered by the registration fee.

Many members probably think the $3.00 they pay for membership goes into the general fund; this is not and has never been the case as the cost of the publication of the JOURNAL consumes all of this amount and the Society receives no part of it.

In the other services of the Society, further advances are being made. The Research Board is still proceeding with their work and stands ready to help the members whenever asked to do so. The slide sets are in continuous use by the many Affiliates, and more slide sets are being prepared as the slides are made available. The Librarian will soon announce the loan department of the Library, for the use of all members of the Society in the United States.

The conventions of the Society, held every other year, are still growing in attendance and interest and give promise of becoming even larger than at present. In other parts of this JOURNAL is another article telling of the country where our next convention will be held.

The 1955 Convention promises to be the largest attendance of any of our past conventions and now is an ideal time for all of you to begin to plan to be there and partake of all the many different facets of the conventions. Remember, the conventions are for you, the members, so attend and get your share of the fun and enjoyment there for you.

HOMER G. RUSH, *President.*

* * *

CORRECTION: The caption of Fig. 120 in Vol. XXVI, No. 6, pg. 184 should read *Myrtillocactus geometrizans*. We are very much distressed that only one member has called this to our attention.

BINDING JOURNALS
Last Call

This year we will bind JOURNALS as in the past. Mail your magazines complete with indexes to Cactus Journal, 132 W. Union St., Pasadena, California, together with $2.50 for each volume (back issues can be bound but no special bindings or other books) and they will be returned pospaid with 90 days. We cannot accept any JOURNALS for binding after January 31.

**Opuntia compressa?*

FIG. 12. *Haworthia margaritifera* var. *minima* (Ait.) Uitewaal approx. x 0.5

FIG. 13
A. Looking west into Oaxaca—view from Cerro Mojón de la Olla, near the Oaxaca—Chiapas boundary. Zapotec legend has it that this is the last refuge of the "bini-dani"—wild people, who refused to accept Spanish domination, and fled to the hills.

In the Footsteps of Purpus

By T. MACDOUGALL

For years Monserrate had been to me, a strategic spot on map of Chiapas, Mexico. Then, one day, a chance acquaintance on a Oaxaca bus proved to be none other than don Javier del Pino. When we parted I had an invitation to visit his hacienda — Monserrate. Monserrate (see fig. I) is near the western edge of the Cintalapa valley, at an altitude of about 2000 ft. To the west lies uninhabited eastern Oax.—"perhaps the least explored area in all Mexico."

My interest in Monserrate had been as a possible addition point of entry into this unexplored forest of Oax. But that is another story! By this time, 1950, I had come to know that Monserrate was a favorite collecting center for the botanist, C. A. Purpus. My present intent—plus a few digressions—is to describe and picture something of the countryside and flora Purpus knew.

Don Javier's anecdotes of "Purpusiana" are often amusing. On one collecting trip, Purpus lagged behind, but that was not considered unusual, nor cause for alarm, that is, until his riderless horse caught up with the rest of the party. Don Javier relates how he returned, back along the trail, to find Purpus "dangling from a tree like a monkey." A low overhanging branch had hooked him by the sweater.

According to don Javier, Purpus was a small man with a large head, a combination which Purpus himself jokingly referred to as the one he needed for his work.

The first day at Monserrate served to familiarize me with the nearby flora. The flatlands, that have not been cleared for cultivation, are covered with xerophytic woods; the hills with open stands of pine. Succulent species include *Lemaireocereus "pruinosus," Cephalocereus quadricentralis* Daw. (see fig. G.), *Cactus oaxacensis, Hylocereus undatus, Selenicereus sp. Bromelia karatas,* and the coral-red flowered *Hechtia meziana* Smith (see fig. H.) the type collection of which was made here by Purpus. In January, the trails are white with *Euphorbia leucocephala* and the flowers of a shrubby Veronia fill the air with the fragrance of vanilla.

Next day we ranged farther afield and walked, some three "leguas," to the abandoned coffee plantation of El Fénix. My companion was Raúl García, from a nearby agrarian colony. Later we were joined by Valentín Goldames, a old timer, veteran of the revolutionary fighting. El Fénix is in a patch of rain forest on the northern slope of a ridge, to the north of, and about 1000 ft. higher than Monserrate. In the less humid areas surrounding this rain forest, growing chiefly on oaks, are two species of Epiphyllums. One of these may be identical with the

"orchid cactus" "Kinchinjunga" (see fig. E.) which, in turn, is listed as synonymous with Epiphyllum "stenopetalum—C. A. Purpus." My assumption is that Purpus collected "Kinchinjunga" during his visits to Monserrate. Perhaps research into the writings of Rose and Purpus would throw light on this! Along with *E. kinchinjunga* from the Monserrate area, two other Epiphyllum numbers,—one collected in the sierra madre of Chis., and the other from Oax.—flowered in New York. All three proved to be one and the same species.

More than a year passed before I returned to Monserrate. Both Raúl and Valentin were on hand, eager for more field work, and, on March 3, 1951, we took a west by north course, following the Río Monserrate, the headwaters area of which was to be our objective. Two hours upstream from Monserrate we entered a border of bottom land with a vigorous growth of hardwood trees, intermixed with a very tall organ cactus that appeared to be a species in *Lemaireocereus*. It was here that my companions spotted a lone tejón* (fig. C.) on an isolated tree, and a hunt began. None of us carried firearms, but Valentín had his two dogs along. By dint of stone throwing and shouting the quarry was harried into making a false move and it fell to the ground with a thud. There was a rush of men and dogs toward it, but the tough little animal recovered in time and bolted up an organ cactus. Here again it was marooned. Raúl proceeded to chop down the órgano but the falling cactus passed near other trees, and this gave the tejón another chance, it leapt to safety and made good its escape.

The fallen cactus was one of the tallest in the stand. I paced its length as very nearly 50 ft. Valentín did a more accurate job, with a stick cut to the "meter mark" on his belly, he measured it exactly 15 meters. The fruit descriptions by both men tend to confirm its identity as a *Lemaireocereus*. The good soil, and part shade, of its habitat may partly account for the exceptionally height of this *Lemaireocereus*. The branches are few, glaucous green, and commonly with 8 ribs. Areoles 2-2.5 cm. apart on the ribs, and bearing spines, to 2.5 cm. in length, in groups of 5-7. A central spine is stouter than the others and is usually the longest. On the tops of older stems the spines tend to become bristly and more numerous.

Tillandsias became increasingly conspicuous as we gained altitude. In shady places were colonies of *T. flabellata,* each branched, red inflorescence a bouquet in itself. In more open stands, above the "Caida de la Bandera," growing on oaks, were scattered individuals of *T. lucida.* The purple-pink bracts of this species are attractive among the reds, yellows, and greens of other Tillandsias. Epiphyllum "Kinchinjunga" now re-appeared, some plants already forming their stout, angular flower buds. This, and a new number in Cycadaceae—a species of Ceratozamia—were noteworthy here.

It was late afternoon when we reached the divide. The source of the Río de Monserrate was on the slopes of a peak, now behind us. To our front, drainage was now to the west. The streams of both watersheds eventually become part of the Grijalva river, which flows through state of Tabasco and into the Gulf of Mexico.

Our camp-site for the night was a pleasant spot, under high pines and with a view over the Cintalapa valley to the east. Early in the morning Venus was high and bright above the valley, to be followed, in order, by Mercury and the sun.

That morning we were up and out with the sun—before breakfast. Plans called for first climbing "Mojón de la Olla," the peak to our north, and water for breakfast was to the south. The photo of the *Ceratozamia* was taken on the southern slope of "Mojon de la Olla." Prof. Eizi Matuda, of the Insctituto de Biologia, considers it near *C. matudae* (Lundell) but probably an undescribed species. Our climb up "Mojón de la Olla" was slowed in places by the thorny re-growth on old burns, but once on top we were rewarded by a magnificent view into the uninhabited corner of Oax. Well satisfied with the pre-view of this immense area awaiting exploration, we back tracked to our camp-site and continued south, along to a ravine where there was water. On the way, we had studied the peak yet to be climbed. The ascent promised no difficulties, but the north-west face, with its cloud forest flora, where we proposed to come down, was steep and rugged. It behooved us to visualize its features, from where they could be seen. At the beginning we passed many fine plants of *Epiphyllum kinchinjunga,* some with buds ready to burst, but not a single flower actually open. At times we walked over beds of a club moss (Lycopodium sp.), raising clouds of spores with every step. I did not know, at the time, that this powder is used by the pyro-

*(tejón) resembles a racoon in size and habits.

B. During the night the, luminous appearing, white flowers of *Acanthocereus* opened around camp. C. Group of tall *Lemaireocereus*—scene of tejón hunt. D. A young plant of *Ceratozamia* sp., and Raul. E. *Epiphyllum "kinchinjunga"* in habitat. F. *Tillandsia grandis* and a low branched oak form a living wall, on Cerro de Monserrate. G. *Cephalocereus quadricentralis* Daw., near Cintalapa.

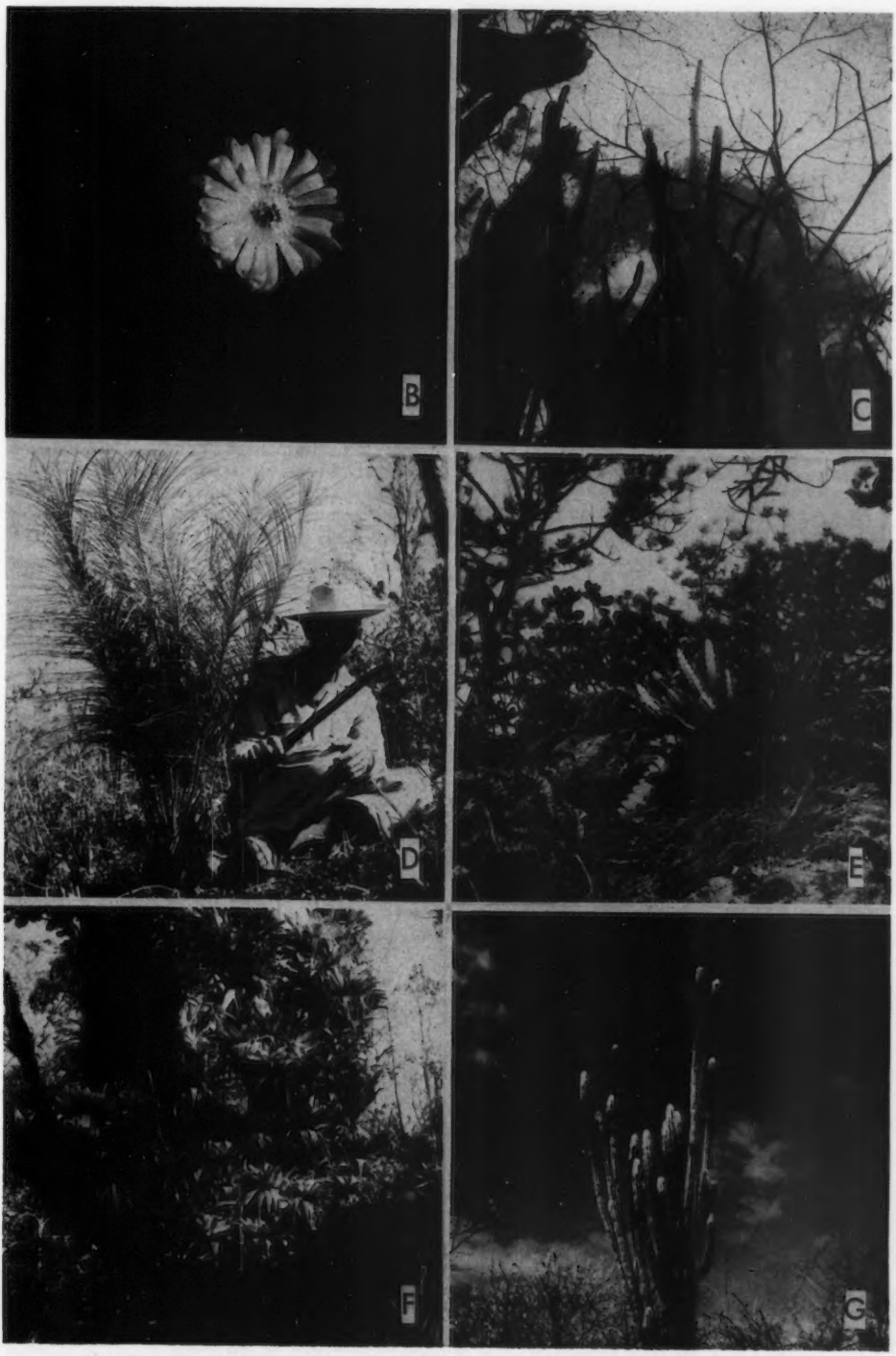


FIG. 14

FIG. 15. H. *Hechtia meziana* and Victor Pérez.

technist, or I might have experimented. Orchids, *Odontoglossum maculatum,* and *Arpophyllum spicatum,* were in bloom along our way. Two new numbers in Begonia were collected, one characterised by its purple-red sap, the other by the hairy-bristles covering the undersurface of the leaves and forming horizontal fringes on the margins. On top of the peak, a rock-bald allowed us more fine views. To the south rose the picturesque shapes of Cerro Pecho Blanco and Cerro del Hermitaño. In the thin soil on and around the rock on which we stood, a dwarf shrubby *Epidendrum* was freely producing its soft pink flowers. The identity is not yet forthcoming. This same terrestrial orchid grows on Cerro Otravesado in Oax.

After a little reconnoitering along the top, we made a decision and started down. Later we were to find our judgment had been bad, but for a while all went well. The moist luxuriant vegetation testified to the moisture deposited on this slope by the prevailing north winds of the dry season. Bromeliads are especially abundant. A dwarf shrubby *Sedum,* near *S. cuspidatum,* grew on rock ledges. It was a new number for me and one which has not yet been satisfactorily identified.

The going now became increasingly rough,

FIG. 16
I. Hacienda Monserrate—peak of Cerro Pecho Blanco, in rear center.

on occasions we would be stopped at the top of low cliffs, to spend time looking for an opening or a way around. In compensation, much of the rough terrain was cushioned by extensive beds of a beautiful moss. By this time we were looking for a place to spend the night. At darkness we were lucky to find, and clear a small, near level, camp-site at the foot of a cliff. In the darkness I recognized the large, variegated leaves of *Peperomia maculosa,* a seldom collected species, and the bristly leaved *Begonia* seen during the day; both grew on the cliff beside us. Later, in the moonlight, a kinkajou paid three visits; on one it drop a "present." Near misses with stones did not scare the animal. Mosquitos were less amusing. They must breed freely in the water of bromel rosettes, yet in other localities, where bromels also abound, mosquitos may be rare.

Next morning we started down before dawn and soon had reached a sparkling little stream. It was our first water since noon the day before. Not long after this breakfast stop we intercepted our trail of the first day and, by late afternoon were back at Monserrate.

Don Javier had no name for the second peak we climbed, yet it is the chief source of the stream on which he depends for irrigation and household water. We now know it by the logical name of Cerro de Monserrate.

Separated patches of rain forest are typical of the area west and north of Monserrate. No two have quite the same flora. In addition, the various plant zones, from xerophytic to rain forest, result in a wealth of plant species. The outcrops of both sandstone and limestone, in the Cintalapa valley and vicinity, are still another diversifying factor.

All of which adds up to good collecting—in the footsteps of Purpus.

FROM PENNSYLVANIA

I thought I would write of a few ideas that have occurred to me.

Once again the cold days have shortened and cacti are stored for the winter needing little care beyond an occasional watering and going over for insects and scale. What does the cactus enthusiast do during these months? This is the time for me when the cactus catalogues come out of the bookcase to be pored over looking for new types to be purchased in the spring. The list becomes so long and I know I have not the space for them. I day dream wishing for a green house or thinking how nice it would be to live in a state where cacti can be kept outdoors the year round. Then I get out all the back numbers of the Journal and read of others raising cacti under conditions not as favorable as mine—those in apartments or in still colder climates. I have 135 pots many containing two or more plants in addition to my other type house plants. If I wish to enjoy seeing them all that is necessary is to step into one room or another and look at them on the window-sills or go down a few stairs to the basement for others. I am not bothered with escaping coal gas or sudden drops in temperature. Insects, ants or termites are not in the house and I do not have the expense of repairing nor fumigating. I imagine if I did have a green house or a pot of ground in a warm state I would out-grow them as I have outgrown the house in which I live.

During the winter months, too, the succulents are interesting to watch as many of mine continue to grow or put forth new growth early in the season. However, they grow more swiftly than the cacti and some, especially the agaves and aloes, become so large it is difficult to know what to do with them.

During the winter I enjoy reading the back issues of the JOURNAL and frequently note that some cacti that were considered new cacti at the time of publication I now have in my collection. It gives me the feeling that I am keeping up with the times.

I notice that so many times the question of mealy bugs is asked. I feel that I am almost an expert on that topic as I have so many of them. In our side yard there is a hawthorne tree that becomes infested with them each year and consequently they get on the cacti. Volck, of course, is considered the best spray, but lately I have been using nothing but alcohol applied with a paint brush unless the plant is very much infected. I find this is very satisfactory and does not discolor the plant. Also it seems to me they come when the plants are dry, and now when I see some bugs on the plant I apply alcohol and water the plant rather thoroughly even during the rest period and the bugs do not seem to recur as quickly. The hawthorne tree I mentioned is in a section of the yard that we have never bothered with. It never received any water except rain and the ground, of course, becomes hard and baked. However, this summer we used even that section of the yard for excess garden plants and due to the severe drought constant watering was necessary. In the early summer when the mealy bugs appeared I sprayed with Volck and then when they persisted I cleaned the tree the way I do the cacti with a paint brush and alcohol. This was a tremendous task on a 30 year old tree. Fortunately the bugs come only on the trunk and lower branches. The point is they never came back all summer, whereas in other years I have had to spray every week until cold weather sets in and the bugs are killed with the cold. Whether it was the alcohol applied by hand or the increased watering, or it was an off year for mealy bugs I do not know, but I am inclined to think it was watering. However, I cleaned the tree just before going away at the end of June and no planting was done around the tree until later in July and the bugs would have had plenty of time to appear. When I returned three weeks later I expected to see another infestation and another job of cleaning them off awaiting me. The mealy bugs always spread to everything: laurels, shrubbery and even the plumbago on the bank. When I returned there wasn't a sign of one and I never sprayed the entire summer. All of those plants received more water than in any previous years. Mealy bugs do not seem to harm outdoor plants; they are just unsightly. The hawthorne tree blooms profusely every year and the plumbago spreads and blooms. I would be glad to hear of any other experiences of ridding outdoor plants of mealy bugs. Any nursery man or gardener we contact always trims the tree, but it has never done any good. This is the first year we have been without the bugs. So was it due to water, alcohol or nature?

Do other people coddle a particular cactus regardless of what happens to it? I had one experience especially that I think also shows the hardiness of cacti. About five years ago I bought a rose plaid cactus that for some reason lost its roots and would never reroot. For over two years I tried every avail-

able method I knew, with Rootone and without. But it would not root—just continued getting flatter and flatter, but remaining a beautiful red. I used to place it on the top of dish gardens to give a little color. Then finally one spring it was so thin (about as thin as thin cardboard) I threw it way on the grass. However, it looked such a pretty red agaist the green grass that once again I dipped it in Rootone and put it in a tiny flower pot. Within three days it had rooted and by the end of the summer was a usual formed Gymnocalycium. The following summer when I again placed it outside a rabbit ate a big piece out of the side of it. The plant healed and continued to grow. Finally, this summer it bloomed constantly and stopped only by the cool weather. It is not a beautiful looking plant with a piece taken out of its side and it is a runt, but the poor thing has certainly tried to stay alive.

This has turned out to be a longer letter than I expected and I must apologize, but it is interesting to express one's thoughts to another having the same interest.

EDITH R. BUTLER
4598 Castor Avenue
Philadelphia, Pa.

CACTUS IN THE BIG CITY

New York is a colossal city. And its residents are always ready to point out that it has the world's tallest buildings, largest population, biggest harbor. And they point with pride to their immense hospitals, huge museums and their multitude of restaurants, theaters and other places of culture and recreation. And for many years cactus lovers in New York could point with pride to the New York Botanical Garden. The following excerpt is taken from the introduction to the booklet published by the Garden in 1942 entitled, "Succulent Plants of New and Old World Deserts" by E. J. Alexander:

"During the past few years the collections of succulent plants have been steadily built up, largely by exchange and gift, until they rank among the most complete in the country . . . of the 1600 species represented, about 600 are of the desert type of cacti, all native of the Americas. They occupy House 7 . . . on one side of them in House 8, are other succulent plants of the New World . . . while on the other side in House 6, are grouped the succulent plants of the Old World . . . "

Last year the Botanical Garden embarked upon a program of rehabilitation and the cactus and succulent houses were closed to the public. Remembering the beautiful collection of plants that had given me so much pleasure over the years it was with great eagerness that I looked forward to the reopening of the houses. However, disturbing reports began to reach me from other cactus lovers to the effect that the cactus collection as we once knew it was no more. Personal matters kept me from visiting the Garden until early August. It was a hot Sunday and Mrs. Emma accompanied me on the long hot ride by subway and as we rode we consoled ourselves with the thought that perhaps our informants had overstated their case. Arriving at the Garden, where work is still in progress, we found the old entrance closed and after much leg work in the hot sun we found the new entrance. By this time my wife was too exhausted to accompany me further and so I hastened alone to the cactus house.

The sight that greeted me was a heartbreaking one. The entire succulent collection—or what is left of it—is placed in one house with cacti occupying roughly one-fourth of the space. Gone are the Mammillarias and all the melon, globular and dwarf growing types—gone are the benches where once could be seen cacti growing from seed, where every stage in the growth of the plants could be seen. All that remains are a handful of mutilated Opuntias and a monotonous clump of columnar Cerei. Dead plants dumped unceremoniously all about—rotted and mutilated ones in evidence everywhere—and ants—millions of ants having themselves a field day!

It was with a sad heart that I retraced by steps and arriving once more at the main portion of the conservatory I came upon my wife gazing aghast at the sight there. A huge rock formation had been built over which water will eventually spill, cascading down into a glass fronted pool below which had been constructed an elaborate sunken walk. This, we thought, must be costing a prodigious amount of money. And therein lies the crux of the situation. It would seem that the New York Botanical Garden is more interested in catering to the whims of those people who like their pleasures synthetic and the honest nature lover has been lost in the shuffle. I would suggest, as a further improvement, a roller-coaster and a shooting gallery.

And now to get back to more pleasing things in the cactus world. It was my good fortune recently to become acquainted, through the pages of the Cactus Journal, with William and Florence Jurth of Larchmont. Bill had read a previous bit of mine published in the Journal and he telephoned me with the intent of seeing my modest collection. But upon discovering that Bill had some 500 cacti I invited myself up to see his. This Jurths live in an apartment and when their collection threatened to drive them out of house and home, they rented space in a nearby greenhouse. Their cacti are a joy to behold—all in good health and all properly labelled. I might add that Florence takes care of the cataloguing while Bill handles the culture—perfect teamwork. In addition to the many more common species there are several very rare cacti of which the Jurths are justly proud. They share another hobby in common—painting. Both Florence and Bill are water-colorists of the first order and have both won prizes in many shows. Shells, rocks, stamps and photography round out their list of hobbies. All in all, it was one of the most enjoyable days we can recall. One of the greatest joys that can be derived from the pursuit of any serious hobby is the sharing of that hobby with someone else. While it may not always be possible to share them personally we can share them in spirit through the pages of our Cactus and Succulent Journal.

JOSEPH EMMA

FROM ENGLAND

I am writing to let you know of an odd occurrence that happened in my collection during the recent eclipse of the sun, which was in the part of this country where I live about 75% total.

About half an hour before the eclipse was at its height, I went into my greenhouse and noticed a plant of *Echinopsis multiplex* was in bloom (this by the way was about 12:45 p.m. in the day). It was *not out* when I looked in about an hour before, I also noticed two buds on a *Selenicereus grandiflorus* were about half open (these incidentally did not fully open till the following evening). Also, I had two plants of *Stomatium* (Mesembryanthemae) out in full bloom (these usually bloom in the evening).

What I can't understand is, I had another plant of *Echinopsis multiplex* with a bud on it, that looked to me in the morning, at about the same degree of de-development as the other, and this did not open till the usual time in the evening. Perhaps one of your members can explain this.

What I should like to know is, if any of your members had similar experiences during the eclipse, which

I believe was also total in some parts of your country. I am making inquires as to whether other people had similar happenings in this country, but it will be some time before I hear from all quarters.

I should like to read in the JOURNAL Ladislaus Cutak's opinion on the above, and if during other eclipses before, the same thing has happened and been observed.

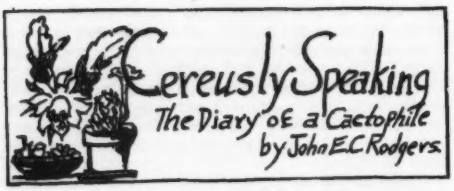
I am very pleased with the standard of items in your JOURNAL and look forward to their arrival every two months. I should like to see them back soon as a monthly, as it helps us in this country to see your way of life (which is so much different from ours). We cannot go out in this country to see our beloved plants growing in the wild and bring a few specimens home; I wish sometimes I was out there, but I suppose like all good things it also has its setbacks. Still I think the majority of us would still like to be there, setbacks and all. It's only a dream for most of us over here anyway; I doubt if I shall ever be able to come. But you can never tell, nowadays, with air travel, it doesn't take many hours now does it to get from one country to the other?

I am, in a weeks time, going to Worthing on holiday, (I believe it is called vacation in your country), and while there I hope to pay a visit on Mr. Lamb of W. T. Neale & Co., Ltd. (It was through him that I obtained membership to your Society), and while there I hope to see his large collection of plants; it is, I believe, one of the largest in this country. I am looking forward to it very much and it will be to me one of my most exciting moments. I will enjoy every minute of my visit, I also hope to have a long chat with Mr. Lamb.

I should like to get into some of your Society's activities; could it be arranged for me to be in one of your Cactus Round Robins? We, in this country, seem to be left out of a lot of things; admitting we are a long way away from each other, but could not something be arranged for us? We seem to have only your JOURNAL to look forward to. I don't know how many members you have in this country, but if we could get into a group with London as the centerpiece we could, if there are enough of us, arrange some activities ourselves over here; you could see with the aid of the JOURNAL what can be arranged for us.

MR. R. STRANGE
Sherborne Road, Basingstoke,
Hampshire, England

FIG. 17. *Adromischus festivus* showing crested flower stalk x 0.3. This is not uncommon in this genus and also in *Echeveria.* Haselton photo.



The race to get the succulents in ahead of the cold weather was won again by yours truly. The plants certainly did enjoy the cool weather for at least three weeks after most collections about here were housed. My diaries (4 volumes from 1933-1953) helped me to gauge the time. I finished digging my sweet potatoes and picking my best tomatoes and peppers just five hours ahead of the 10-inch snowfall of October 30th and 31st. The 30th I got the plants housed in the morning and the afternoon the garden stuff.

Yes, there is something peaceful after the "great rush" but I think the buds I get these last weeks in the cool air on the Rhipsalis, Zygocactus, "Christmas Cactus," Pseudorhipsalis, Echeverias, Crassulas, and Epiphyllums (late buds and blooms), amply repay me for the "hurry" I use to get them in once I brushed snow from the Epiphyllums, etc., didn't hurt them a bit. It melted in the pots in the greenhouse.

The whole collection looked lush and beautiful but it took one of the driest summers we've had in the 80 years of weather bureau history. Then the wettest October since 1906 (just ½ inch difference though). The excess of rainfall above the normal was 6.84 inches. The plants dripped, the pots oozed and the clouds rained more. I gave them a spraying three times a week with one or two generous waterings which I call the *"Drip through the drainage hole"* variety. The morning and afternoon sun warmed them but the noon sun was screened out by the grape leaves overhead so they remained green and happy. The humidity is high here usually. Not going below 40 even in the driest weather. This no doubt accounts for my success with the Epiphytes.

Dry weather has its compensations besides keeping the lawn grass short, it retarded weeds in the garden, and kept the spray gun idle. I've noticed that "mealy bugs," thrip and spine bug infested plants are cleaned up outside each year, but this year the usual marauders, slugs, worms and beetles were practically non-existent and plant damage was kept to a minimum. The striped cucumber beetle left its favorite Crassula alone as well as the Korean Chrysanthemums. The Crassula plant attracts the beetles even when the Chrysanthemum scented flowers are not on it. This year it was outside and was not eaten at all. Ordinarily the stems, leaves and flower stalk is so badly chewed it has to be broken up and rerooted. It is in bloom now and for the first time it is "whole," thanks to dry weather.

The only trouble I find with the late rains we have here is, it makes the plants brittle and in the "rush" they do break. The buds of the *Zygocactus truncatus* are over an inch long. I keep the greenhouse cool so that the buds adjust themselves to the inside conditions so I never lose any of them. *Rhipsalis houlettiana* was completely edged with hundreds of white bells along the two to three foot stems. It was the finest display I've had in all of the sixteen years of ownership. The stems are pink to red now.

The Southwesterns arranged on a "step" flower stand reveled in the full sun they got for five to eight hours a day. The plants were put out April 20th on the back porch and moved to the stand in mid May. They got spring soaked and fall soaked but the water did not stand in the pots so they were happy. However, I do have a *Lophophora williamsii, Harrisia regelii* and *Graptopetalum amethystinum* in a pot without drainage which held water until emptied. All three plants did excellently as they did last year. The three wintered well in 1953 and resumed a normal growth this spring. I do not advocate poor drainage but I do think some plants do not resent more water than we "pussy footers" are prone to give them. I'm too lazy or too artistic or, too downright attached to my Crassulas and Echeverias leggy growth to break out the rosettes and reroot them. (I think it's the last one—*attachment* that motivates me.) When I see "collectors" desecrating the succulent beauty of these plants I think well they're only showing how they feel about the rest of us—*getting older*. Be that as it may I'm a firm believer in the right of these plants to get leggy. The leaf scars on the Echeverias, Kleinias, Aloes, etc., are beautiful. The Aloes cloak themselves in papery leaf buts which closely resembles the palms.

Some of the new Sansevieria growth creeps out over the edge of the pot and becomes quite decorative. This is true of a short stemmed type resembling *S. cylindrica. S. parva* as well as *S. hahnii* and others send up underground shoots which can fill and crack the pots they're in. They cannot stand much cold as they freeze easily.

The matter of soils has taken up part of my time this last summer. Poor soils waste my time while rich soils may create trouble, so I've come to the conclusion in that a good firm granulated soil is the answer to the problem for me. I do not like to repot too frequently. It takes time to build such an ideal soil but I've found it pays in lush growth, good spine growth, and long life. I use maple leaf mold granulated by long exposure to air, rain, snow, freezing weather and earth worm working over. With sand, steamed bone meal, gravel slaked lime, limestone pieces, etc., it can be made to fit any and all types of succulent plants.

I've used it on all of the succulent types and I find the roots seek around, in and about the granulated leaf mold for food. De-pot the plants and the soil granules are held so that the roots are covered. The slacked lime, sand and gravel addition suit the Southwesterns, the steamed bone meal addition suit the Epiphytes and the sand and gravel lighten any soil for the others.

The very fact that the cacti and other succulents have a "poor-root-system" means that they need easily available minerals as well as vitamins or whatever else the rarer elements are to be called. Most cactophiles that visit me remark about the health of most of my plants. Of course we all have our *"Skeletons-in-the-closet types"* which I am constantly trying to rehabilitate by slight to drastic changes in soils to see if I can't find the "sesame" for them also.

When I first started back in 1932 I followed my oldest friend in terms of Cactography, Eugene Ziegler of Spencerport, New York, who advocated *"decayed straw-sand"* formula. I still feel it is ideal but too dry for most of my recent purchases. Drainage is perfect. The soil is friable and easily kept from losing its porosity. It is also free from weeds. Such soils can be mixed for all succulents with additions of granulated peat moss or leaf-mold for Epiphytes; borax for Southwesterns and sand and gravel for perfect drainage types.

JOHN E. C. RODGERS
1229—8th Street, Lorain, Ohio

To be continued

SPINE CHATS

LADISLAUS CUTAK

Although I had not met Dr. David Fairchild in person during my two early visits to Florida, because each time he was absent from his Kampong, I did have the pleasure of corresponding with this noble plantsman. Some of my information for SPINE CHATS was volunteered by this great plant explorer. I've read all of his books and enjoyed them fully and hoped that I could accomplish some of the feats credited to him. Who doesn't love to dream?

Now this great man has left the earthly paradise. He died during the early part of August, 1954, in his 85th year. The horticultural world lost one of its greatest men, for Dr. Fairchild has been responsible for the introduction of many ornamentals and tropical fruits, as well as new crops that have revolutionized our agriculture. He organized the office of seed and plant introduction of the U. S. Department of Agriculture in 1904 and was in charge of that office for 24 years. He collected plants all over the world and made a number of explorations into the Far East under the sponsorship of Messrs. Barbour Lathrop and Allison Armour. He also headed the expedition on the Chinese junk "Cheng Ho" which was sponsored by Mrs. Anne Archbold and from which experience he wrote his interesting book, "Garden Islands of the Great East," which I cherish in my own library. On this expedition he brought a wealth of plant material for the Fairchild Tropical Garden. Some of these plants I will see during the latter part of January, 1955, when I'll be in Florida on a business and lecture trip.

* * *

The world lost a second great plantsman in 1954 with the passing of Dr. Liberty Hyde Bailey on Christmas night. He was 96 years old. This gentleman was also a correspondent of mine and a few years ago he favored me with an autographed copy of his poems which I shall always cherish as a prized memento. Dr. Bailey is perhaps best known for his Cyclopedia of Horticulture which over a long period has served as a handy reference tool for all horticulturists. Dr. Bailey, in his lifetime, was interested in a great number of plant groups, chief among them the classification of palms, a study he carried on in his late life. When in his late 80's he still made field trips into regions which younger men hesitated to undertake. Dr. Bailey was dean of the College of Agriculture at Cornell University from 1903 until 1913 and lived at Ithaca until his death. He gave to Cornell his personal collection of plant material now housed in the Bailey Hortorium.

* * *

Borzicactus tessellatus is a new species of cactus described in Succulenta, (Nov.-Dec. 1954), official organ of the Dutch and Belgian Cactus and Succulent Society. The authors, John F. Akers and A. F. H. Buining, state that it is a bright green much branched plant up to 6 feet tall, occurring only in a narrow zone midway between Churin and Oyon in central Peru, along the river Huaura. The stems of this cactus are 5 to 6 ribbed, characterized by six-sided faceted tubercles, each with a diamond-shaped areole bearing 10 short radial spines and usually one central which is quite heavy and awlshaped. The flowers are cylindric, from near the tip of branches, red and but slightly zygomorphic. The species is closely related to *Borzicactus fieldianus*.

* * *

In the months of April and May, 1953, a group of biologists from the Biological Institute of the University of Mexico conducted excursions to various places in the High Mixteca of Oaxaca and among the group was our friend Helia Bravo Hollis, who was commissioned to collect botanical specimens, particularly of the cactus family. As a result of this excursion, Helia Bravo has now published a report in the Anales del Instituto de Biologia (25: 1954, Nos. 1 & 2) in which she fully describes 27 species of cacti, six of them new. The new species are *Opuntia huajuapensis, Coryphantha melleospina, C. pseudoradians, Mammillaria mixtecensis, M. huajuapensis* and *M. casoi*.

Opuntia huajuapensis is a shrubby prickly pear with mostly large obovate to orbicular, slightly glaucous green pads. Areoles are spaced about an inch apart and bear gray felt, yellowish glochids and 7 to 8 whitish spines. Flower are 2 to 2½ inches long, yellow with white filaments and style. The species belongs in the Series *Orbiculatae* which is characterized by the presence of hair in the areoles. It is closely related to *O.pilifera. Coryphantha melleospina* resembles *C. retusa* but differs chiefly from that species in the yellow color and disposition of the spines which hide the body. The tubercles are disposed in 8-13 series with narrowly elliptic areoles bearing white wool in youth and 17 to 19, subulate, radial spines of translucent color. *C. pseudoradians* possesses a simple globose body, gray green in color and somewhat glaucous. Tubercles appear in 13 series, are oblique with rhomboid base and somewhat soft in texture. There are 13 to 15 radial spines, mostly yellow in color with brown tips and occasionally 1 or 2 centrals in the upper part of the areole. Flowers are yellow, the sepals with a broad reddish midstripe. *Mammillaria mixtecensis* possesses a simple globose body, depressed at the apex, where somewhat it is woolly. Tubercles are arranged in 13 spirals and are milky with woolly axils in youth and short white bristles. There are 8 to 9, white radial spines and 6 to 7 centrals that are heavier, longer and darker in color. Flowers are purple with purple filaments, white style and 6 whitish stigma lobes. *M. huajuapensis* also has a simple globose body, with milky tubercles arranged in 21-34 spirals and numerous white bristles in their axils. There are 6 to 8 white radial spines and usually 2, reddish brown centrals with darker tips. Flowers are purple. It is closely related to *M. collinsii* and *M. confusa* var. *centrispina. M. casoi* is related to *M. mystax*. It has a dichotomous, globose body with firm milky tubercles arranged in 13-21 spirals. Axils of the tubercles in the flowering zone bear white wool and some bristles. There are 3 to 4 central spines, yellowish to red brown, the three upper ones much shorter. There are 5 to 7 short white radial spines. Flowers are purple with pale rose filaments and yellow anthers. The style is cream colored in the lower part and rose in the upper with 4 to 5 light green stigmas. All of the new species as well as the others in the report are illustrated with good photographs.

FOR THE GROWERS

SEEDS	$1.00—Pre-inventory Sale—$1.00	SEEDS
Lemaireocereus dumortieri	1,000 seeds	$1.00
Lemaireocereus pruinosis	1,000 seeds	$1.00
Myrtillocactus schenkii	1,000 seeds	$1.00
Ferocactus wislizeni	1,000 seeds	$1.00
Ferocactus acanthodes	1,000 seeds	$1.00
Echinocereus rigidissimus	1,000 seeds	$1.00
Astrophytum asterias	400 seeds	$1.00
Espostoa lanata	200 seeds	$1.00
Parodia mutabilis	200 seeds	$1.00
Eriosyce bruchii	100 seeds	$1.00
Euphorbia obesa	20 seeds	$1.00
Mam. heyderi	50 pods	$1.00
Mam. microcarpa	50 pods	$1.00
Mam. heyderi-macdougalli	40 pods	$1.00

First come, first served. Minimum order $2.00

All orders sent Postpaid in U.S.

"World Famous"

ROCKING HORSE CACTUS GARDENS

2415 W. Glenrosa **Phoenix, Arizona**

FROM MEXICO

If you wish to obtain beautiful and rare Cactus Plants, ask for my Price List, which will be sent to you free of charge. When sending order, please enclose your permit tag or just the number of it. If you do not have it, please write for one to: U.S. Department of Agriculture, Import and Permit Section, 209 River Street, Hoboken, N. J.

FRITZ SCHWARZ

Apartado 347 **San Luis Potosi** **S.L.P. Mexico**

NATIVE PLANTS

"Toumeya Papyracantha; Coloradoa Mesa Verde; Mam. Wrightii and other rare southwestern cacti available at reasonable prices. New Mexico Cactus & Succulent Research, Box 335, Belen, New Mexico."

DENIS COWPER

Belen **New Mexico**

COLLECTIONS OF MEXICAN CACTI

25 for $12.50	50 for $22.50
10 Specimen Mammillarias	$ 6.00
10 Show Plants, all different	12.00

Send import tages and cash with order.
We pay postage and 25% export duty.
Satisfaction guaranteed

LA QUINTA—F. SCHMOLL
Cadereyta des Montes, Qro., Mexico

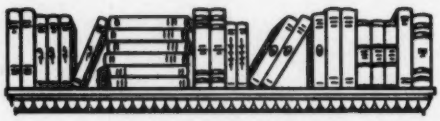
JUBILEE PRICE LIST

celebrating 25 years in the cactus business and 50 years in the ornamental nursery business is ready for mailing. Many unusual items including *Pachycereus orcutti* are listed. Many illustrations.

GATES CACTUS, INC.—CORONA, CALIF.

SALM-DYCK

The rare work on succulent plants, by Salm-Dyck is available in Fascicules 1, 2, 3, 4, 6 and 7, containing 183 of the 352 plates of the complete total in the seven Fascicules. It is uncommon to find even single Fascicules offered for sale and the incomplete set, as mentioned, is available from E. S. Gourlay, 124 Nile Street, New Zealand, for $250.00, which can be deposited with Scott E. Haselton.



CACTI IN FULL COLOR

The Flowering Cactus—Raymond Carlson and R. C. and Claire Meyer Proctor. This long-watched for book is now available and every cactus collector will want a copy. There are 115 photographs, 81 of which *are full color.* The full page plates are breath-taking in their brilliancy. The text is written for the layman and includes descriptions of the various groups, chapters on cultivation, photography and distribution. This beautiful book is 9x12 inches, $7.50, postpaid, plus sales tax in California.

MONOGRAPH ON SUCCULENTS

Handbuch der Sukkulenten Pflanzen—Herman Jacobsen. The first volume of a complete monograph on succulent plants is now ready. It contains 600 pages and 500 illustrations covering the genera in alphabetical order through Euphorbia. Price $14.00, postage 40c, plus sales tax in California.

BRITTON AND ROSE MONOGRAPH

"The Cactaceae," the only complete monograph on cacti in the English language. This set consists of four volumes, 1048 pages, 9x12", and contains 127 one-color full page reproductions from the original colored plates, 1120 additional illustrations on cacti, 7800 cactus names together with descriptions, keys, indexes, and thousands of synonyms. This is the most complete work ever published, and is considered an absolute necessity to libraries, botanists, students and collectors. The reprint edition of this well-known work is now almost exhausted and may now be classified as a rare book item. $62.50 post-paid in U.S.A. Please add sales tax on sales in California.

ABBEY GARDEN PRESS

132 W. Union Street **Pasadena, California**

FOR EXCHANGE

Surplus cacti and succulents. Write Marybella Blehm, Harrisburg, Ore.